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USSR Report

ENERGY

No. 39

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NUCLEAR POWER MACHINE BUILDING AT ATOMMASH

Moscow TRUD in Russian 12 Sep 80 p 2

[Article by V. Pershin, deputy minister of Power Machine Building, general director of the Production Association Atommash: "Discipline, Creativity and Mutual Assistance"]

[Excerpts] Parts for the second and third reactors are now being machined on plant equipment and other power equipment is being manufactured. We are faced with a task of more complete utilization of the production capacities of Atommash.

Not only the reactor vessel, the steam generator vessel and the volume compensator, which are already being manufactured at production sites of Atommash, but also the intravessel devices, heat-exchange equipment, control systems and shielding, transport equipment and biological shielding, that is, the entire nomenclature provided by TEO--technical and economic justification for construction of Atommash--are required to make up nuclear power plants. The problem of completing the construction of the giant plant in order that the production capacities provided by the TEO to produce eight million kilowatts of atomic power equipment annually in the required nomenclature is acute. A total of 1 billion 533 million rubles allocated for industrial and nonindustrial construction must be assimilated within compressed deadlines.

Moreover, attention toward erection of the objects of Atommash has recently been flagging on the part of a number of construction, installation and outfitting enterprises and organizations. This was also noted at the last meeting of the AUCCTU Coordinating Committee, called upon within the framework of the "Worker's relay race" to coordinate the efforts of many ministries and agencies to outfit and construct the plant. The Yuzhstal'konstruktsiya and Yuzhtekhmontazh Trusts of Minmontazhspetsstroy [Ministry of Installation and Special Construction Work] of the USSR have clearly slowed down the rates of installing assembled steel sections and production equipment, as a result of which buildings Nos. 2 and 4, containing the starting complexes for 1980, have not yet been covered with panels, while installation of equipment at the second unit of building No. 1 is being carried out at impermissibly low rates. The Volgodonskenergostroy Trust of Minenergo [Ministry of Power and Electrification] of the USSR permitted dispersion of its forces this year on other construction projects, thus weakening the construction site at Atommash. In sum, the plan of construction and installation work during eight months was fulfilled by only 86 percent and 15,470,000 rubles were not assimilated. Interruptions in supplying the plant with equipment, especially with electrotechnical equipment, increased. Among the debtors are the Mukachevpribor Plant, the Kazan' Plant Teplokontrol' and the Cheboksary Electrical Equipment Plant of Minelektrotekhprom [Ministry of the Electrotechnical Industry].

The problem of supplying Atommash with qualified workers and engineering and technical personnel, of which we still have a shortage and the demand for which will increase as new capacities are introduced, remains a burning and acute issue as before. More housing, children's preschool institutions and cultural, commercial and health objects must be constructed for successful solution of the problem and recruitment of people at the plant. The office of the Rostov Obkom of the CPSU, having considered this problem, posed the task of ensuring introduction of not less than 300,000 square meters of housing annually in 1981 and subsequent years. But Minenergo of the USSR is accepting only 40 million rubles' worth of construction and installation work next year for nonindustrial construction and this is completely inadequate to solve the posed problem.

The fact that Gosplan of the USSR and the State Committee of the RSFSR on Labor have not yet made positive decisions on supplying the second unit of the enterprise with qualified personnel by organized selection in the republics, krays and oblasts, as was done for the first unit, does not contribute to support of Atommash with personnel.

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ELECTRIC POWER

ENERGY POTENTIAL OF KAZAKHSTAN DESCRIBED

Moscow SEL'SKAYA GAZETA in Russian 26 Aug 80 p 2

[Article by A. Gurskiy: "From the Station According to the Plan of GOELRO"]

[Excerpts] The former turbine operator was on duty in the control room at the moment when the message about the success of the collective of the Khariuzovka Plant came into the control panel.

"According to present standards, its capacity is of course low," says Vladimir Fedorovich. "But the plant has begun with enormous changes. More powerful plants will appear within several years alongside the first GES on the Irtysh, Ul'ba and other rivers of the ore-rich Altay. Having been joined into a single ring, the hydroelectric power plants will help to change the face of this rich kray. It became the center of Kazakhstan's nonferrous metallurgy even during the prewar years."

Having created a sufficiently powerful energy base in the east, the republic has become able to carry out construction in other regions more intensively. On the eve of the battle of Stalingrad, a red light symbolizing the birth of the first Karaganda GRES lit up on the map. It permitted the miners to double coal output.

And production of ferroalloys was begun with introduction of the Aktyubinskaya TETs, which helped to increase the output of various types of weapons for the front. The hydroelectric power plants of the Alma-Ata cascade became operational one after the other along with this and the capacities of the Emba oil fields and the railroad junctions increased.

Even more lights--symbols of the electric power of the republic--appeared on the map of the power engineers during the postwar period. New plants were supplied with incomparably more powerful turbines. The network of electric power transmission lines was increased to almost 350,000 kilometers.

"The power engineering of the republic, where the main source of light 60 years ago were smoky candles made from mutton fat," continues V. Vasilenko, "became a mighty productive force. The Yermakovskaya GRES alone surpassed the design capacity of all plants constructed in the country according to the GOELRO [State Committee for the Electrification of Russia] Plan 1.5-fold.

The energy potential of Kazakhstan will almost triple with startup of the unique constallation of the Ekibastuz GRES, which the entire country is erecting according to the decisions of the 25th CPSU Congress. Burning local inexpensive lignite, the five plants with total capacity of 20 million kilowatts will accelerate further development of the republic's economy. The new fuel and energy complex will also serve the industry of the Urals, Western Siberia, Central Asia and the central regions of the European USSR.

The Ekibastuz Thermoelectric Power Plants have already been noted on the control diagram of power engineers. But the lamp of the first energy unit of GRES-1 still burns on the map. And meanwhile starting and adjusting tests of the second and installation of the third units--"500,000-kilowatt units"--are under way and the foundations for the next GRES are being laid.

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ELECTRIC POWER

NEW TURBINES FOR AES COMPLETED

Moscow PRAVDA in Russian 30 Sep 80 p 1

[Article by Pravda Correspondent I. Lakhno: "How the 'Million-Kilowatt' Turbine Was Born"]

[Excerpts] This event was awaited with excitement. Everyone was waiting--from the chief designer of the plant to the janitor. And now the last assemblies of the giant turbine have been carefully loaded onto special rail flatcars. This is a "one million"--a turbine with capacity of one million kilowatts for the Yuzhno-Ukrainskaya Atomic Power Plant.

The collective of the Khar'kov Turbine Plant imeni S. M. Kirov has completed the most important task of the 10th Five-Year Plan. A unique turbounit has been developed and an important page has been written in development of atomic power engineering. Plant specialists pledged to complete all the technical documentation for another atomic turbine of the same capacity ahead of schedule, by the day the 26th CPSU Congress opens.

"Yershist," noted the fitter V. Kalyuk, touching the fan of the turbine blades with his palm. "Incidentally, when assembled the rotor weighs 186 tons."

Looking at this engineering miracle, one is amazed at both its perfection and the skill of the people whose hands created the energy unit, which can supply a city of one million with electricity.

It was not enough to simply double the capacity of the unit, but an essentially new model had to be developed here.

The fact is that the designers thought of doubling the number of revolutions in the future turbine compared to previous ones. But this would have required an increase in the length of the blades and reinforcement of a number of other assemblies. "Quiet running" was then much more reliable in operation. As a result, due to the increased capacity of the unit, it was possible to reduce its metal consumption and laboriousness of manufacture to a large degree. The expenditures for operation of a plant equipped with these turbines is also considerably less.

The production equipment for machining the assemblies was manufactured together with them. For example, manufacture of forgings of individual parts of the superheavy rotors was organized rapidly in Leningrad at the Izhorsk Plant. But how is one to join and weld them? The All-Union Planning and Production Institute of Power Machine Building helped the plant to develop a special installation for assembly and argon-arc welding of the rotors. And the Kramatorsk Heavy Machine Tool Building Plant imeni V. Ya. Chubar' developed an original sintering lathe with numerical program control for subsequent machining of the large parts. The large vessel parts weighing up to 200 tons are machined on a machine tool manufactured at Ul'yanovsk.

The most complex engineering problem--successful joining of the superheavy turbine in the large assemblies for convenient transport and installation of them--was solved in an original manner.

And here is another innovation. The giant turbine could unfortunately not be tested at the plant. But it does contain assemblies and components which cannot be dispatched to the AES without this. The specialists decided to construct a bench at the enterprise for balancing the low-pressure rotors. Mechanisms were also developed to facilitate installation and adjustment of parts. A special chamber appeared where the rotors are turned in a deep vacuum to revolutions which exceed the maximum working mode. After the individual assemblies are checked universally in this manner, one can state confidently that the unit will operate reliably "when assembled."

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BRIEFS

POWER PLANT CONSTRUCTION--Khorog--New diesel-electric power plants, each with capacity of 800 kilowatts, will be erected at Murgab and Rushan. It is planned to use them to introduce powerful pumping stations into operation and to bring electricity to villages and poultry farms. The collective is also rendering important supervisory assistance to the sovkhozes of the oblast in electrification of remote populated points of the high-altitude kray. A figure of 30 million kilowatt-hours was recorded on 1 September on the "counters" of the electric power plants of the Pamirs. This amount of electric energy has been generated by the high-altitude electric power plants since the beginning of the year. [Excerpts] [Dushanbe KOMMUNIST TAJIKISTAN in Russian 4 Sep 80 p 1] 6521

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ENERGY CONSERVATION

RSFSR SEEKS ECONOMIC MEASURES TO ENCOURAGE ENERGY CONSERVATION

Moscow SOVETSKAYA ROSSIYA in Russian 25 Sep 80 p 1

[Article by Yu. Popov: "Keep Strict Track of Energy Resources"]

[Text] This year the inhabitants of Orenburgskaya Oblast have established a tradition of holding "thrift evenings." For these occasions the local newspapers, radio, and television appeal to citizens to turn off lights in empty rooms in every house and apartment, to turn off unneeded electrical appliances, and to install bulbs of lower wattage in auxiliary quarters. With just three such evenings they saved 130,000 kilowatt-hours of electricity, which is enough, for example, to operate an enterprise such as the Orenburg Drilling Equipment Plant for more than five days. That is how great the impact was from flicking off switches, from having every citizen follow the common rule, "Turn off the light when you leave." But it is not just a matter of the direct economic result. Energy supervision agencies received many suggestions from the population on ways to save energy and specific addresses where waste was occurring. The campaign itself teaches people to be guided by rules of economy at all times without reminders.

But the results could be even greater if there were strict compliance with these rules on the job. After all, 89 percent of the total fuel expenditure in the RSFSR, 84 percent of thermal energy, and 93 percent of electricity is used for production and operations needs. Saving just one percent of fuel-energy resources for the country as a whole is equivalent to saving 17-18 million tons of standard fuel a year.

Production is growing, and along with its needs more petroleum, gas, and coal deposits are being put into operation and new power plants are being brought on line. Centralized heat supply is developing broadly. "But no matter how rapidly we may develop the energy system," Comrade L. I. Brezhnev emphasized at the November 1979 Plenum of the CPSU Central Committee, "conserving heat and energy will continue to be an important national challenge in the future."

In the present year the working people of the Russian Federation have done fairly well in observing conservation measures. In the first six months for the republic as a whole 210,000 tons of fuel less than envisioned by norms was used, while for thermal energy the savings was 1.4 million gigacalories, and for electricity 600 million kilowatt-hours. The greatest number of thrifty collectives was found in the light and fuel industries and the republic ministries of Housing and Civil Construction and Land Reclamation and Water Resources.

But alongside them there are still many enterprises and organizations that permit overexpenditures. The number is especially large in the building materials industry. One out of six collectives there did not meet established fuel norms and roughly one out of 10 used too much thermal and electrical energy. The situation is only slightly better in the meat-dairy and textile industries and river fleet. But if the enterprises and organizations that used too much had kept within norms, an additional 97,000 tons of boiler-furnace fuel, 539,000 gigacalories of heat, and 95.4 million kilowatt-hours of electricity would have been conserved for the RSFSR system.

Unfortunately, kilowatts and gigacalories continue to be wasted and tens of thousands of tons of fuel are burned needlessly. How can we explain the fact that some use fuel and energy resources in a rational, thrifty manner while others waste them? The first consideration is the condition, the technical level of production itself. Take the famous Magnitka plant. Year after year while building up capacities and carrying on extensive reconstruction, the plant also carries out major organizational-technical steps for energy conservation. In the first six months of this year, for example, the collective provided more than one-third of the entire savings for Chelyabinskaya Oblast. By contrast, the Chelyabinsk Metallurgical Plant accounts for 30 percent of the oblast's fuel overexpenditure. The reasons are irregular work by blast furnaces which now need major modernization and above-norm downtime.

Specialists have calculated that improving industrial processes, lowering the energy-intensiveness of equipment, fuller utilization of secondary resources, and other organizational-technical steps could reduce unproductive expenditure of energy and fuel by roughly one-third. But what about the rest? What causes it and how can it be eliminated? If we summarize all the different reasons, they boil down to an irresponsible attitude toward conservation measures and poor monitoring and control.

A typical picture was disclosed by a survey made by the inspection service of the RSFSR State Committee for Petroleum Products in Yaroslavskaya, Ivanovskaya, and Kostromskaya oblasts. The plans of organizational-technical measures to conserve fuel resources in practically all the collectives inspected were written in such a formalistic manner that no one could tell the inspectors which part had been carried out and which had not. As a result, fuel was squandered in municipal services and administrations of land reclamation and water management.

When the subject of keeping track of fuel and energy use comes up, administrators usually make the excuse of a shortage of control and measuring equipment. It is true that nearly one-fourth of the enterprises in several energy-intensive sectors do not have instruments for plant-wide records of heat expenditure. For this same reason, records of heat delivered are not kept at about 60 percent of the boiler rooms of the RSFSR housing and municipal services system. The complaint which production workers make against the USSR Ministry of Instrument Making, Automation Equipment, and Control Systems is entirely sound. But it is not just a matter of technical equipment. The very organization of record-keeping and distribution of crucial national economic resources is sometimes very primitive.

Lack of supervision is especially telling in agriculture. For example, as long as five years ago the RSFSR State Sel'khoztekhnika Committee was supposed to organize special sections to improve technical service to petroleum storage facilities at kolkhozes and sovkhozes. But this work has only recently gotten underway. And the situation is as follows: more than half of the 60 Sel'khoztekhnika storage facilities inspected were not being maintained satisfactorily: the tanks were not sealed, fittings leaked, and fuel was distributed in buckets although many of the storage facilities have fuel pumps. Cases of misappropriation were also found.

The result of this poor management is graphic: in 1975 112 kilograms of fuel were spent per hectare of arable land, but today the figure is 16 percent higher. And some sorry managers are not averse to sounding the alarm because of this, figuring that the state will give agriculture fuel in any case.

This is a narrow departmental position. It is also seen in some other sectors where the very process of establishing norms for expenditure of energy resources bails out the departments. They are not based on scientific parameters, but rather on the level achieved and they use techniques of statistical calculation that do not take leading domestic and foreign experience into account. Many labor collectives are not adequately oriented to the campaign to observe conservation measures during socialist competition. Conservation results are not always taken into account in summarizing fulfillment of assignments and obligations. No one is responsible for failure to meet these indicators.

How can we overcome such an attitude toward extremely valuable public property? Various suggestions are made, envisioning administrative and economic measures. They come down to one thing: conservation planning should be an organic part of the assignment for production of output and waste should be unprofitable to the energy user. But the search for such a mechanism, for such economic levers only continues.

In reality, bonus payments for conservation of fuel, for example, are still based on its cost. But the price of gasoline, diesel fuel, and lubricating oils is low in our country. Bonus payments are miserly and do not give strong incentive to use fuel efficiently. It is true, on the other hand, that flagrant violators are occasionally fined. But this step is not sufficiently effective; sometimes the loss is made up by bonuses for other production indicators.

In the opinion of specialists, this problem can only be solved when the indicator for reducing expenditure of fuel and energy resources has a direct influence on the size of enterprise economic stimulation funds. Incidentally, the same suggestion is being made with respect to equipment suppliers; the indicator of energy-intensiveness should be one of the principal criteria for evaluating it and should reflect the economic efficiency of producing such equipment.

As the documents of the CPSU Central Committee emphasize , carrying out party policy for energy conservation in all elements of industry, agriculture, construction, transportation, and municipal services is a crucial economic and political challenge. We must develop a mass movement for conservation among the working people and increase the significance of economy measures in evaluating the economic activity of production collectives and summarizing the results of socialist competition.

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ENERGY CONSERVATION

STEPS NEEDED TO STOCKPILE FUEL FOR WINTER

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Sep 80 p 1

[Editorial: "Fuel for Winter"]

[Excerpts] It is a difficult challenge. The prolonged spring had a definite effect. Even in May and June economic units in many regions of the country were forced to use fuel beyond norms instead of accumulating it.

Gas extraction workers took a very serious attitude toward this problem. Since the beginning of the year the national economy has already received more than 4 billion cubic meters of fuel beyond the plan. The collectives of the all-Union industrial associations Orenburggazprom [Orenburg Gas Industry] and Ukrgazprom [Ukrainian Gas Industry] and the production associations Tyumentransgaz [Tyumen' Gas Transportation] and Lentransgaz [Leningrad Gas Transportation] have been outstanding.

The schedule for accumulation of winter fuel supplies is not being followed. Despite the high rate of extraction, the Ministry of Gas Industry is behind schedule in pumping gas to underground storage tanks, especially in the Ukraine. Supplies of mazut fuel oil are not being replenished quickly enough. The employees of the RSFSR State Committee for Petroleum Products and Soyuzglavneft' [Main Administration for Interrepublic Deliveries of Petroleum Products] are not showing adequate initiative in supplying fuel to power industry workers. The employees of the coal industry have not completely fulfilled their assignment.

The work of the miners is falling behind particularly in the Kuznets and Donets basins. In the second quarter alone they fell about 4 million tons of coal short. At the same time, above-norm coal supplies accumulated at many underground mines.

In the time remaining until winter we have every opportunity to overcome the shortage that has developed. In July and August the Ministry of Railroads was able to concentrate a sufficient fleet of cars for regular shipping of Kuznets, Donets, and other types of coal and also mazut fuel oil. Suppliers are no longer experiencing a shortage of transportation.

We must not forget the accountability of energy workers themselves for creating winter fuel supplies. At the GRES's [state regional power plants] and TETs's [central heat and electric power plants] today there must be reliable, uninterrupted work by storehouse machinery: lift trucks, excavators, bulldozers, car tippers, and fuel transmission lines. Most of the power plants in the Urals are setting an example of how to organize uninterrupted fuel receiving. The practices of employees of the Krakhovskaya GRES of the Donets Basin Energy System deserve particularly fixed attention and study. While consistently modernizing equipment the collective there improves the reliability of machinery year after year all along the path of the coal from the car tipper to the furnace. They have also accumulated considerable experience with processing and burning the lowest grades of solid fuel. However, fuel transportation shops and equipment are not well prepared everywhere. Things are still bad at TETs-22 of the Moscow Energy System, the Kurganskaya TETs, and several other energy enterprises.

It is especially important today for power plants to procure and use low-grade fuels: industrial products, slags, and high-moisture coals. During the winter removing moisture from them and preparing them for burning will require great energy and labor expenditures.

The equipment and preparedness of storage facilities at housing and municipal organizations of the cities and rayons are as important as at power plants. Care must also be taken with selling fuel to the population, making use of the positive experience of Kirgizia, Latvia, and several other republics and oblasts where fuel delivery to the home has been organized.

The well-known decree of the USSR Council of Ministers entitled "Supplying the Economy and Population with Fuel, Electricity, and Thermal Energy in the Fall and Winter of 1980-1981" poses concrete assignments and outlines effective steps. Party organizations are expected to monitor their fulfillment and see that enterprises are thoroughly prepared for winter.

One of the main conditions is establishing a smooth-running fuel transportation conveyor from the point of extraction to the user. In this connection the initiative shown by the mining, railroad, and energy workers of Ekibastuz deserves high praise. They have achieved tangible results by competing among themselves for timely, uninterrupted delivery of coal to power plants in Kazakhstan, Siberia, and the Urals. Such cooperation by associated groups of workers deserves support and broad dissemination.

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REGIONS OF SIBERIA, FAR EAST ON THRESHOLD OF 26TH CPSU CONGRESS

Moscow PROBLEMY DAL'NEGO VOSTOKA in Russian No 3, 1980 signed to press 22 Aug 80 pp 55-73

[Article by V. A. Aleksandrov]

[Text] The economy of Siberia and the Soviet Far East has been developing dynamically throughout the 10th Five-Year Plan as part of the unified national economic complex of the USSR. In accordance with the decisions of the 25th CPSU Congress, the nation's eastern regions were designated for quicker growth for the purpose of the fuller and quicker utilization of their strong natural potential. Industrial production growth here should be greater than the national average by one-fifth and, if possible, even by one-fourth.[1] This will accomplish the dual task of continuing to augment production in the vast territory east of the Urals and including this territory's unique capabilities in nationwide economic processes.

The development of Siberia and the Far East has been a matter of constant concern for the CPSU Central Committee and the highest Soviet government organs. During the 5 years, party and governmental decisions were adopted in regard to many facets of industrial and agricultural production, science and culture and the social aspect of life in Siberia and the Far East. The spring 1978 tour of Siberia and the Far East by General Secretary of the CPSU Central Committee and Chairman of the USSR Supreme Soviet Presidium L. I. Brezhnev was of inestimable value. It helped to mobilize additional production reserves and promoted the successful implementation of the CPSU line of comprehensively developing the natural resources and productive forces of these regions.

Any discussion of the final results of work performed throughout the nation or in any particular part of the nation prior to the end of the 1976-1980 5-year cycle would naturally be premature, but a vivid picture of the dramatic improvement in the national economy of Siberia and the Far East and its growing contribution in the strengthening of world socialist forces can be derived from an analysis of the indicators of certain leading branches and the status of the key projects specified in party congress decisions.

Oil and Gas Complex

The development of the fuel industry has been accelerated in complete accordance with the decisions of the 25th CPSU Congress and the five-year plan in Siberia and in the Far East. The extensive use of Siberian deposits of oil, gas and coal has made the Soviet Union the only large industrial state in the world to base its economic development on its own fuel and energy resources. This is an extremely important prerequisite for the uninterrupted growth of the Soviet economy and it is also one of the significant factors determining its substantial superiority to the economies of the leading capitalist countries, all of which, without exception, are dependent on imported sources of energy.

The growth of oil and gas production in Siberia is unparalleled in world history. Here is how quickly oil production is being augmented in the West Siberian lowlands: The drilling equipment of geological prospectors first indicated a deposit on 25 September 1959, creating the hope of future success. The first oil deposit was discovered in 1960 on the banks of the Konda River, where the city of Uray now stands. Even after this, however, it took some time to arrange for the production of oil on the industrial scale. In 1964 the first 200,000 tons of Siberian oil were sent to the Omsk Refinery. The first million-ton mark was reached the next year, and in 1970 the production level had already reached 28.5 million tons of oil and gas condensate.

In 1975 West Siberia reached the production level of 143 million tons of oil a year. The objective of turning West Siberia into the main center of oil production was set for the 10th Five-Year Plan. This objective was attained. In 1980, the last year of the 10th Five-Year Plan, the output of oil and gas condensate in Siberia will amount to 315 million tons. This is higher than the indicators approved by the 25th CPSU Congress, the decisions of which specified a West Siberian oil production level of 300-310 million tons.[2] Siberia has not only taken on the responsibility for the entire increment in national oil production, but has also made the reduction of production levels in several other regions possible. This is where 52 percent of all the oil and gas condensate in the Soviet Union comes from. Approximately 1 out of every 10 tons of liquid fuel extracted in the world comes from Siberia. Here is another indicative statistic: Whereas it took 14 years to produce the first billion tons of Siberian oil (1964-1978), it should only take one-third as long to produce the second billion.

Equally rapid growth is characteristic of natural gas production. In September 1953 the spray which burst out of an exploratory well in the city of Berezov signaled the discovery of the largest gas deposit in the world. Within 13 years the Siberian gas was being transported to the Urals and was an important component of national fuel and energy resources.

In the current 5-year period, gas production began at the largest known gas condensate deposit in the world, in Urengoy, located on the Yamal Peninsula at the North Pole. The gas-bearing strata discovered here at a depth of 1,000-1,250 and 2,300-3,150 meters contain more than 5 trillion cubic meters of gas.

In 1978, the first year of exploitation, the output here was almost 16 billion cubic meters of gas, the next year it was over 26 billion, and this year--the last year of the five-year plan--the total output should reach 58 billion cubic meters. The output will subsequently be increased to 100 billion, and it is probable that Urengoy will yield 200-250 billion cubic meters of natural gas a year in the future.

A total of 163 billion cubic meters of gas will already be extracted this year from West Siberia's Urengoy, Medvezh'ye, Vyngapur and other fields. This will be 37 percent of the unionwide output.[3] The decisions of the 25th CPSU Congress specified that the gas output of this region should be increased to 125-155 billion cubic meters. This means that the party congress indicators will be surpassed in this important area of Siberian development as well.[4]

Naturally, this rapid development of the West Siberian oil and gas complex has not been spontaneous. It is the result of thoroughly considered party policy and the selfless efforts of hundreds of thousands of people who are now laboring under severe conditions. Their high degree of labor enthusiasm, great sense of responsibility, courage and labor heroism were commended by L. I. Brezhnev in his address to the leading collectives of Tyumenskaya Oblast after they took on stepped-up commitments to accelerate drilling operations and augment oil and gas production capacities.[5]

This description of the West Siberian oil and gas complex, with its abundance of statistics and excursions into past history, has not been presented solely for the purpose of proving that this region has made an increasing contribution to the development of the Soviet national economy. In recent years, many statements have been made abroad to cast doubts on the potential of oil and gas deposits in the east of the USSR.

Every trick has been resorted to for this purpose. London's FINANCIAL TIMES, for example, resumed its practice of citing American CIA reports in May of this year. The experts from this agency apparently feel that it is one of their main duties to issue "forecasts" of Soviet development from time to time. Although these forecasts are superficial, they nonetheless serve to temporarily please the enemies of the Soviet Union by predicting certain insurmountable difficulties which will supposedly impede the successful development of the Soviet economy.

Without entering into any arguments with those who have made ill-will toward the USSR their profession, we would like to point out a few facts. In the first place, since barren ground produces nothing, it takes substantial natural resources to quickly become the world's largest producer of oil. It is a well-known fact that more than 270 oil and gas deposits were discovered just in the first 3 years of the current five-year plan in the USSR, mainly in Siberia. The present level of production confirms the existence of considerable resources.

In the second place, the Siberian regions of oil and gas production are among the youngest in the world in terms of exploitation time. If deposits with a history stretching over centuries are still producing, then what kind of future will newly discovered deposits have?

In the third place, according to experts, Siberia has revealed only part of its treasures. From day to day, it presents us with new generous surprises. For example, oil has suddenly begun spouting from a depth of 3,000 meters below the gas condensate strata in the Urengoy gas deposit. The secrets of many remote regions have not been revealed as yet. And this applies to more than just the West Siberian sub-Arctic zone. Industrial deposits of gas are also being discovered in the Yakut ASSR, and exploratory operations are being conducted off the coast of Sakhalin. Besides this, there is the question of off-shore oil. Paleozoic oil and gas deposits, hidden at a depth of 5 or more kilometers from the earth's surface, are waiting to be discovered.

Finally, the potential of all existing fields is far from fully utilized. After all, in the majority of countries, people have only learned to take less than a third of known reserves out of their beds. In the Soviet Union progressive methods have considerably raised the oil output coefficient. In the 10th Five-Year Plan, Soviet Minister of the Petroleum Industry N. A. Mal'tsev said, several new methods of increasing the oil output were perfected: the pumping of surfactant and polymer solutions, caustic soda, sulfuric acid, trisodium phosphate, foam systems, heat-transfer agents (hot water and steam) and intrastratum combustion. The development and implementation of new methods of secondary and tertiary recovery could considerably increase the yield of each deposit.[6]

Socialism is energetically placing scientific and technical achievements at the service of the national economy and is thereby guaranteeing unprecedented success in economic development.

According to some estimates, the earth contains at least 77 trillion tons of hydrocarbons, much of which is concentrated in the Soviet Union, which takes up one-sixth of the earth's surface. In 100 years of oil production, no more than 9 billion tons of liquid fuel has been recovered in the USSR. Imagine the substantial wealth that lies in store for the Soviet people and the resources our people will place at the service of communism!

Although the extraction of energy resources is only part of the total oil and gas complex, which also includes a transportation network, storage facilities and capacities for the purification and processing of raw materials, the success in oil and gas production in the 10th Five-Year Plan provides grounds for several important conclusions.

Above all, the development of the Siberian oil and gas complex has considerably strengthened the economy of the Soviet Union and has made the accelerated development of many branches of the economy possible, including power engineering, the chemical industry and transportation, and on this basis--machine building, agriculture and the production of consumer goods. The output of energy sources in the USSR in 1965 amounted to 966 million tons of conventional fuel, and the figure in 1978 was 1.79 billion tons. In the first case, oil and gas accounted for 51.3 percent of national reserves, and in the second the figure was 70.3 percent.[7]

The massive construction project in West Siberia presents extensive opportunities for broader international cooperation, it is strengthening socialist economic integration and it is reinforcing the material basis of the policy of peaceful coexistence. Fuel and electric power represented more than 17 percent of all Soviet exports in 1965, but the figure in 1978 already exceeded 35 percent, and the value of each percentage of Soviet exports increased during that time from 73 million rubles to 356 million.[8] Siberia's contribution to the augmentation of Soviet export potential is indisputable.[9]

It is also significant that the present output of Siberian crude hydrocarbons has been made possible almost totally by the USSR's own technical scientific and other resources and the labor of the Soviet people. Cooperation with other countries was a contributing factor, but not the decisive one. This means that the development of gas and oil production will continue to be dynamic in the future and will create additional opportunities for mutually beneficial cooperation between the USSR and other countries. Moreover, no external factor can stop Siberia's constant progress. With a view to the prediction of famous Russian scientist M. V. Lomonosov, the Soviet people are firmly convinced that the resources of their nation will continue to be augmented considerably by the Siberian and northern regions.

In the Coalfields

The decisions of the 25th CPSU Congress set the objective of improving the structure of national fuel and energy resources and, for this purpose, of efficiently combining various types of fuel and using coal more extensively.[10]

Particular significance in the 10th Five-Year Plan is assigned to the expanded mining of coal in eastern regions, including Siberia and the Far East. The work here has progressed in two ways. One is the remodeling and modernization of existing coal mines and pits. This is true primarily of the Kuznetsk Basin. The other has been the accelerated development of new coal regions and the establishment of powerful energy complexes on this basis, primarily through the use of the more economical open-pit method of coal mining. This applies primarily to the Southern Yakut coal region and Kansk-Achinsk fuel and energy complex specified in party congress documents.[11]

The Kuznetsk Basin, whose exploitation became a symbol of Soviet industrial development in the early 1930's, is the nation's second-largest coal base after the Don Basin. In 1979 the Kuzbass accounted for almost 155 million tons of the total 752 million tons of coal mined in the nation. The increase in coal output in this region exceeded 9 percent in the first 4 years of the five-year plan and was higher than the national average. This year the miners of the Kuzbass should extract approximately 162 million tons of coal.

The prospects for the future development of the Kuzbass are also excellent; after all, it is this region that provides most of the coking coal for metallurgy in the USSR, as well as in Japan and several other countries. By the end of the current five-year plan, there will be 50 mines operating here with an average yield of 2.8 million tons a year and 20 pits with an average yield of 6.5 million tons. Total annual coal production in the Kuzbass will reach approximately 270 million tons.

The necessary steps are being taken in advance to achieve these high indicators without any considerable increase in the number of workers. In accordance with party technical policy, the coal mining industry is being re-equipped. The pioneer in the improvement of the miners' difficult work has been the labor collective of the Raspadskaya Mine in the Kuzbass. Remodeling over the last few years has guaranteed a daily output of 20,000 tons of coal from this mine, or 7.5 million tons of fuel a year. The known reserves here, measuring 45 square kilometers in area, will guarantee that the mine will operate at this level for at least 50 years. The latest methods and the most progressive Soviet and foreign technology are being used in the Raspadskaya Mine, and this has led to the total mechanization of mining operations here. It is not surprising that labor productivity is also high in this mine: The monthly output per worker is 280 tons of coal here in comparison to the branchwide average of 55 tons.

Extensive remodeling and the incorporation of equally progressive technology have been accomplished at the Zenkovskaya Mine with its steep face, where the most valuable reserves of coking coal are concentrated. The Yubileynaya Mine, where the hydraulic method, one of the most complex and efficient methods of mining, is being employed, is producing more than 3.5 million tons a year.

The equipment used in open-pit mining in the Kuzbass is also being replaced. The remodeling of the Coal Pit imeni 50-letiya Oktyabrya, for example, doubled the yield, increasing it to 12 million tons a year. Powerful excavators with a bucket capacity of 40 cubic meters and 120-ton dump trucks are operating in the basin. Labor productivity in open-pit mining is even higher than in leading mines: 600 or more tons a month per worker.

Particular stress was laid on the use of the open-pit method of coal mining in the 10th Five-Year Plan for several reasons. On the one hand, Soviet industry now has the powerful equipment needed for this kind of work. After all, the discovery of deposits and the recovery of fuel necessitate the transport of millions of cubic meters of rock. The presence of this equipment is the main prerequisite for success.

In addition, the economic effectiveness of open-pit mining has been taken into account. According to L. Reznikov, general director of the Kemerovougol' Association, this is due to the following factors: Pits are established much more quickly than mines (3 years and 10 years respectively); the extraction of coal from pits can be accomplished sequentially, prior to the completion of construction work; expenditures are recouped twice as fast, and labor productivity is triple the level for underground mining.[12]

In view of these advantages of the open-pit method, it is being widely used not only in the Kuzbass, but also in the development of other Siberian coal regions--the Kansk-Achinsk and Southern Yakut zones.

The directive documents of the 25th CPSU Congress set the task of speeding up the establishment of the Kansk-Achinsk fuel and energy complex.[13] Congress directives were subsequently set forth in detail in a special decree of the CPSU Central Committee and USSR Council of Ministers "On the Establishment of the Kansk-Achinsk Fuel and Energy Complex."[14] In accordance with this decree, the construction of massive pits, large heat and electric power stations, energy and transport lines and a new modern city has been envisaged for the establishment of the complex in 1979-1990.

The Kansk-Achinsk Fuel and Energy Complex (KATEK) will represent a unique concentration of energy capacities. This is due to the tremendous wealth of this basin, located in the very center of the Asian part of the USSR and extending 800 kilometers along the Trans-Siberian Railroad. According to a general geological estimate, reserves of low-sulfur and low-ash lignite amount to around 1.2 trillion tons here. The open-pit method is to be used in some deposits with a projected yield of 30-50 million tons of coal a year. Highly productive equipment will increase output per worker to 3,000 or more tons a month and will keep overhead costs at 70-90 kopecks a ton. The reserves of coal will increase the actual yield of this region to a billion tons of coal a year. A few electric power stations, two of which will be operating at 6.4 million kilowatts each, will surpass the largest U.S. energy complex--the Tennessee system, where 31 electric power stations are operating at a total capacity of 14 million kilowatts. In time, KATEK will yield around half of the present volume of coal mined in the USSR. The scales of the project are huge in terms of space and time. Experts believe that the open-cast mines and electric power stations of KATEK will serve people for at least 500 years.

We must not lose sight of the possibility that coal will be used not only in power engineering, but also as raw material in the manufacture of other products. As Academician M. A. Styrikovich pointed out, in the future (in the beginning of the 21st century), if the cost of natural liquid fuel should rise considerably and coal is used to the maximum in electric power stations and by other large consumers, it will be expedient to use coal in the broad-scale production of synthetic liquid fuel, primarily in the zones of the mass mining of cheap coal that are located far from centers of consumption.[15]

KATEK is part of Siberia's present as well as its future. The KATEKenergostroy and KATEKuglestroy construction trusts have been established, individual coal pits are being worked, construction work is beginning on the first of a series of giant electric power stations--the Berezovskaya GRES-1, the Krasnoyarsk Heavy-Duty Excavator Plant is being opened to serve open-cast mining, and dozens of scientific institutions are engaged in the resolution of absolutely new technical, ecological and social problems connected with the establishment of a power engineering center, geared toward the use of the latest achievements of technological progress, in the taiga zone. The first tens of thousands of people of various professions are arriving in the region and are settling in cities and villages with a projected total population of around 800,000.

In addition to the Kuzbass and KATEK, another Siberian coal region is also mentioned in the materials of the 25th CPSU Congress--the southern Yakut coal region. These materials specify the need for the accelerated development of this region.[16] For many reasons, this deposit is arousing particular interest. Here coking coal of the best category is located at the very surface in thick strata (of up to 66 meters). One such "nest" near Neryungri contains 450 million tons. A branch of the Baykal-Amur trunk line extends to this location. Coal from this region is already being shipped to cities in the Far East and to export facilities.

The coal resources of the southern Yakut ASSR have been placed at the service of the national economy. An open-cast mine, which will yield 13 million tons of coking coal a year, is being established. An enriching mill is also being built, with a projected output of 9 million tons of coal concentrate. The latest equipment will be used here, guaranteeing the minimum use of manpower.

Southern Yakut coal is now being shipped to the USSR's overseas partners on the existing sections of BAM, part of the Trans-Siberian Railway and from the newly equipped port of Vostochnyy with the very latest type of coal loading berth. The open-cast coalmines in Neryungri are repaying the state treasury for the funds invested in the industrial and transport development of this region.

Siberia and the Far East have been generously endowed with coal deposits in more than just the three large basins listed above. The black squares of coal deposits can be seen in the most diverse points on geological maps of the eastern regions and are densely scattered throughout Primorskiy Kray. The output of coal here also increased during the years of the 10th Five-Year Plan; it exceeded 14 million tons in 1979. The miners of Sakhalin Island extracted around 6 million tons that same year.

In addition to the expansion of coal mining and the establishment of new mines and pits in Siberia and the rest of the nation, much is being done to promote production intensification, increase the processing of raw materials and heighten their qualitative features. In the Kuzbass, near Novokuznetsk, for example, the coal industry's largest enriching complex, the Sibir' complex, which annually processes 6.5 million tons of coking coal, began operating just before the beginning of the 10th Five-Year Plan. Powerful separators, hydraulic precipitation equipment, hydraulic cyclones and flotation machinery operate here as part of a single technological cycle. Modern equipment has been installed here to automate coal enriching and loading operations. Since the beginning of 1980, all of the concentrate produced here has been marked with the State Emblem of Quality. Within a work shift of 8 hours, 324 carloads of this raw material for the metallurgical industry are sent from here to plants in Siberia, the Urals and the center of the nation.

The cleaning, drying and enriching of coal constitute an extremely important task in view of the increasing flow of coal shipments, in which hundreds of millions of tons are transported over thousands of kilometers. Experts have calculated that when unprocessed coal is shipped, water and dirt make up 40-45 percent of the contents of railway cars. The establishment of enrichment mills like the Sibir' complex can considerably reduce shipping costs and make cars available for other freight. It is no coincidence that the establishment of the Neryungri open-cast mine has been accompanied by the construction of an enriching factory in the southern Yakut ASSR. The value of each ton of enriched coal will increase by at least one-third.

What are the advantages of the accelerated development of coal mining in Siberia and the Far East? This question cannot be answered by references to only one aspect of the matter. Many derivatives are apparent here, changing the production and social structure of large regions. At least some of these derivatives should be mentioned.

For one thing, the development of coal mining can strengthen the entire fuel, energy and raw material base in the east. This, in turn, will establish important prerequisites for industrial growth and continued progress in industrial development east of the Urals. Conditions are now better for the more uniform distribution of industrial production units throughout the territory of the USSR. In particular, the long-planned establishment of a new large metallurgical base in the Far East, utilizing Neryungri coking coal and Aldan iron ore, is becoming an increasingly distinct possibility.

The inclusion of hundreds of millions of tons of Siberian coal in national economic circulation will give additional flexibility to fuel, energy and raw material resources in the eastern regions and the nation as a whole. This will permit the conversion of the production of heat and electric power to coal, a cheaper and more abundant fuel, and will make considerable quantities of oil and gas available for use in the chemical and petrochemical industry.

Increased coal mining will expand the export capabilities of the USSR. This is being reflected in two ways. Firstly, direct overseas shipments of coal are growing--for example, shipments of Neryungri coking coal to Japan. Secondly, the improvement of the fuel and energy balance is creating the necessary conditions for a proportional increase in the quantity of crude hydrocarbons designated for export. This is all the more important now that the demand for crude hydrocarbons considerably exceeds the supply in the international market. Judging by all indications, this tendency will not only continue, but will even be more pronounced at the end of the 20th century and the beginning of the 21st. It does not take exceptional foresight to realize that after the spasms of the oil crisis, the economies of the capitalist world will suffer greatly from shortages of other types of non-renewable organic fuel. In this connection as well, the discovery of Siberia's stores of trillions of tons of energy-producing and technological coal is of global importance.

The 10th Five-Year Plan will go down in the chronicle of the Soviet national economy as the very beginning of the era of the great coal of Siberia. The era has had a confident beginning, with scientific calculations and an eye on the future, and this is fitting in the economy of a nation where life is based on the principles of scientific communism.

Plus Electrification

The construction of the Irkutskaya and Bratskaya hydroelectric power stations on the Angar and the Krasnoyarskaya station on the Yenisey inserted brilliant pages into the chronicle of previous five-year plans. In the middle of the current five-year plan, all units of the Ust'-Ilimskaya GES became part of this network. Two years of operating this power station at full capacity turned out to be enough to completely recoup the funds spent on its construction. The electric power produced here is the cheapest in the USSR. The cost of producing 1 kilowatt-hour is 6 kopecks, or one-fourth of the average at all of our nation's hydroelectric power stations.

The successes in hydraulic construction in Siberia and the fulfillment and overfulfillment of plans have been due to many factors. An important one, of course, is the national economy's need for the quick development of power engineering to expand many other production areas, including those requiring high energy input. This is why hydraulic construction plans stipulate high indicators and the allocation of the necessary funds. But there is one other extremely important factor: Power construction organizations have become huge collectives, with all of their operational links coordinated. They are capable of consistently completing the construction of increasingly complex and increasingly economical power equipment. It is as if they are striding up the giant steps of a dam stretching all the way from populated regions to the least developed zones.

The backbone of the organization of builders of the Irkutskaya GES, for example, was the main collective of builders of the Bratskaya GES. Before the work had even been finished in Bratsk, the Bratskgidroenergostroy collective had already begun the work in Ust'-Ilimsk. As soon as the completion of the work in this new city approached, the builders moved to a spot lower on the Angar and began to build the fourth section of the Boguchanskaya GES series.

This collective was used to form another work force, based on the rivers of the Amur basin. It was assigned the task of building the Zeyskaya GES. The start-up of this power station was completed within the 10th Five-Year Plan. But before the work had been finished on the Zeya, the collective began to build a dam on another tributary of the Amur--the Bureya River.

Each hydroelectric power station generally performs a complex of functions: the production of electric energy, the creation of water reserves, the development of land reclamation and river navigation, and so forth. This combination of functions is particularly evident in the structures along the Amur.

The disastrous effects of floods can be seen in many locations along the Amur below the Zeya and Bureya rivers. Muddy streams have turned valley banks, cultivated fields, villages and roads into mere playthings. What could be sadder for a farmer than the sight of wasted labor, when potato stems, cabbage settings, grain sprouts and mown hay are at the mercy of the elements? Periodic natural calamities have been one of the main reasons for the migration of people away from this region.

The dams on the Zeya and Bureya are expected to curb their nasty temperaments. Streams of water running down from the mountains will not reach the valley, but will be locked up in reservoirs. The Zeyskaya GES is already performing its function of taming the elements. In the next five-year plan, the dam on the Bureya will have its turn at this.

The same kind of consistency that was displayed on the Angar and the rivers of the Amur basin is evident on the Yenisey. The document announcing the formal acceptance of the first section of the Yenisey series--the 6 million-kilowatt Krasnoyarskaya GES--was signed in 1972. Soon afterward, however, the Krasnoyarskgesstroy administration moved the construction collective to a new site, where the construction of the world's largest GES, the Sayano-Shushenskaya, began.

After the first unit was started up, the others followed in rapid succession. The start-up of the 10th unit at the beginning of the next five-year plan will bring the total capacity of this station up to 6.4 million kilowatts. The Sayano-Shushenskaya GES is a perfect example of our nation's characteristic progress in the development of power engineering, industry and the economy in general.

The dam in the Sayans will rise to a height of 242 meters and will withstand the pressure of 32 billion cubic meters of water, which will be enclosed in a reservoir 400 kilometers long. The floodgates will be capable of emitting streams of water at a speed of 14,000 cubic meters a second.

This GES will enter the history of hydraulic construction as a project with many new technical features. It began to generate current long before the construction of the dam had been completed and the reservoir was filled. The builders installed temporary impellers which could operate when the dam was only 80 meters high. When the water reaches 120 meters, these impellers will be replaced with permanent units operating at full power. More than 150 inventions were utilized for the first time in the erection of just the hydraulic units.

To diminish the destructive effects of streams of water rushing out of the turbines, the giant dam will be supplemented by its new little sister, the Maynskaya GES. On 22 April of this year, when the 110th anniversary of V. I. Lenin's bi was celebrated, the first load of hydraulic engineering concrete was packed into the retaining wall of this water engineering system. Located a few dozen kilometers downstream, the dam will regulate the water level of the Yenisey, and this will allow the Sayano-Shushenskaya GES to work at full capacity. The production cost of electric energy here will be, just as on other Siberian rivers, one of the lowest in the USSR.

The story of the Siberian and Far Eastern hydroelectric power stations would be incomplete without a discussion of another hydraulic engineering system which began operating this year. This is the Kolymskaya GES, which is being erected on permafrost in the exceptionally severe conditions of the far north. Work began here 8 years ago with the establishment of a workers' village, access roads and a construction base. Now the location already has a dam and a machine room, and energy systems are moving up to their starting positions.

Soon this region of goldminers and miners of other minerals will receive a permanent source of energy, which will provide them with five times as much electricity as all of the 400 local diesel and gas-turbine power installations now operating in the district. And although the Kolymgesstroy Administration, in contrast to other hydraulic construction collectives, did not have a past stretching back decades, its future is just as promising as theirs. The time will come when the present project will be joined on maps by the Ust'-Srednekamsk, Moguchegorsk and other water engineering systems, which will help to radically transform life in this icy region, next to the easternmost part of the USSR--Chukotka.

Power engineering in Siberia and the Far East rests on two bases--hydroelectric power stations and thermal power stations. A combination of the two is essential, as the need for electric power is exceptionally great. And whereas the steep gradient of the rivers in the eastern part of this zone creates favorable conditions for hydraulic power engineering, the plain rivers of the western part call for another solution. Here mineral sources have come to our aid, especially the gas of northern Tyumenskaya Oblast and the coal of Krasnoyarskiy Kray. The former provides for the generation of electric power locally, while the latter makes it possible to convey this power to far-off consumers.

At first the formation of the West Siberian Territorial-Industrial Complex was accomplished with the aid of electric power conveyed from the Urals or generated at local small power stations. The broad scales of the work of investigating oil resources, preparing for the working of deposits and arranging for the provision of new cities and industrial enterprises with all necessary supplies necessitated quick changes in the power engineering geography of West Siberia in the last decade. The most efficient fuel supply alternative was also found: the use of the gas which rose out of the ground along with oil and was not being used in the national economy.

Most of this gas is being used at the Surgutskaya GRES, the power units of which began operating in the current five-year plan. The northern part of West Siberia is no longer receiving energy from the Urals; now it is the industrial Ural zone that is the consumer of Siberian electricity.

The construction of the first GRES in Surgut was followed by the erection of a second station. Six 800,000-kilowatt power blocks will be installed here. The start-up of the first assembly has been scheduled for 1983. In the next few years, the Tobol'skaya TETs will begin operating, and construction work will begin on the Urengoyskaya GRES, the Nizhnevartovskaya TETs and the Tyumenskaya TETs-2. This energy should be enough for the petrochemical enterprises now being built in Tomsk and Tobol'sk and the lumber mills of the kray and its cities and villages. Surplus electric energy will be sent to the European center of the nation.

The Yakutskaya gas-turbine GRES, located near Yakutsk and operating on local natural gas, was erected to satisfy local energy needs. The Gusinoozerskaya GRES in the Buryat ASSR was also built primarily to satisfy local needs, but it is coal-operated. Its energy turned out to be quite convenient in connection with the construction of the Baykal-Amur trunk line. This station also serves as a connecting link between the energy systems of the USSR and MPR.

The next stage in the development of Soviet power engineering will be the power monolith which will be operated with the coal of the Kansk-Achinsk basin. The first of the series of KATEK electric power stations, the Berezovskaya GRES-1, will have eight power blocks, each with a capacity of up to 800,000 kilowatts. This means that the total capacity of the station will be 6.4 million kilowatts, equivalent to the capacity of the Sayano-Shushenskaya GES. It will annually consume 25 million tons of coal, which has undergone preliminary thermal processing, and will generate more than 40 billion kilowatt-hours of electric power. For the transmission of KATEK power to consumers, a high-tension line, never used before in the world, is being developed.

The reinforcement of the energy base in the eastern regions of the USSR is closely connected with the specific branches of industry that have been widely developed in this region in accordance with the decisions of CPSU congresses, namely the development and expansion of power-intensive production fields. It is easy to see that power-intensive production fields--metallurgy, especially nonferrous, the chemical industry and woodworking--symbolize the most progressive industrial trends of our day, utilizing minimum manual labor and maximum technology, with automated sections and entire shops, the extensive use of computers and the coordination of production with science. In short, this signifies Siberian and Far Eastern industry's arrival at the advanced frontiers of scientific and technical progress.

Advance Frontiers of Industry

Industry in the eastern regions has been growing more rapidly as a result of development in two directions that have been characteristic of all Soviet industry in the 10th Five-Year Plan: the remodeling and enlargement of existing enterprises and the creation of new production areas. Whereas emphasis in the extractive industry is placed on the second direction due to the development of new regions, in the processing industry more attention is being given to the first, although it would hardly be correct to say that priority is being given to either.

An idea of how intensively the reorganization of existing enterprises is being accomplished in our day, how production is being modernized during the course of work and what all of this is achieving can be gained from an examination of one of the leaders of modern industry in Siberia--the West Siberian Metallurgical Plant imeni 50-letiye Velikogo Oktyabrya. The anniversary which gave the plant its name testifies that the enterprise is relatively young. The first cast iron was smelted here in 1964, and the production of steel and rolled metal was mastered at the same time.

It does not seem long since blast furnace No 1 first began operating, but in 1977 it was already replaced. The furnace was replaced by another, more powerful one with only a minimum interruption in the work. The result was considerably increased production output and higher levels of labor productivity and production mechanization. The metal increment alone amounted to 600,000 tons a year.

Large shops and assemblies are annually started up at the West Siberian plant, First Secretary L. Gorshkov of the Kemerovskaya CPSU Obkom said. Their actual capacity generally exceeds all projections. This occurs because designs are constantly perfected during the construction process, they are supplemented with the suggestions of efficiency experts and inventors and they absorb the latest scientific and technical achievements.[17]

Due to this creative approach, the projected capacity of the blast furnaces at the plant has been surpassed by almost 17 percent, and steel convertors are operating at a capacity one-third greater than projected. This means that the production of hundreds of thousands of additional tons of metal and items made of this metal is guaranteed. The world's largest "450" medium-grade rolling mill began operating during this 5-year period ahead of schedule at the West Siberian plant. In reference to this achievement by Siberian workers, L. I. Brezhnev stressed in a congratulatory telegram that it proved that the collectives were highly responsible and aware of the importance of their work.

Siberian metallurgy is now distinguished not only by the large scales and high technical standards of its enterprises, but also by a variety of branches.

Siberian nonferrous metallurgy takes in copper, nickel, tin, molybdenum, cobalt, aluminum and other metals. Their production took a large step forward in its development during the current 5-year period.

The Noril'sk Mining and Metallurgical Combine, the construction work on which began in 1935, has become the pride of Siberian nonferrous metallurgy. During the current five-year plan, a new era began in the development of the Noril'sk combine and the entire polar city: A new metallurgical plant began operating on the Nadezhda Plateau. In 1978 it began producing nonferrous semimanufactured metallic items, the next year the first section of the enterprise began operating at full capacity, and the second section should be started up by the end of the five-year plan.

Experts say that the Nadezhda Metallurgical Plant--usually called simply the "Nadezhda"--accomplished a revolution in the industry. In the past, ore with a high sulfur content was not used in the production of copper and nickel. If even a particle of sulfur entered a furnace, it burned out completely and was carried out on the wind. The Nadezhda uses new technology which provides for the derivation of both metal and sulfur. This has resulted in the virtual combination of two branches--metallurgy and the chemical industry. The new plant has increased the output of Noril'sk metals by one-half, it is producing sizeable quantities of sulfur, a valuable chemical raw material, and it is becoming the consumer of millions of tons of ore which previously could not be processed and had to lie around in heaps.

This multiple impact was primarily due to the incorporation of the latest achievements of technological progress and the coordination of science with production. The Nadezhda embodied the labor of scientists in Moscow, Leningrad and many other cities. It attested to the ability of the socialist planned economy to concentrate strong forces in an important sector and to solve problems, no matter how complex. This was the implementation of the specific 25th CPSU Congress directive to "guarantee the continued development of the Noril'sk Mining and Metallurgical Combine."[18]

Reliance on scientific and technical progress and the improvement of qualitative indicators, as specified in 25th CPSU Congress materials, are also characteristic of other combines, plants and factories of nonferrous metallurgy, which are quite numerous in various parts of Siberia. The incorporation of the latest technology is the basis of production development at the Bratsk, Irkutsk and Krasnoyarsk aluminum plants, the Sorsk Molybdenum Combine in Krasnoyarskiy Kray, the Novosibirsk Tin Combine, the Solnechnoye Ore-Dressing Combine in Khabarovskiy Kray and many other enterprises.

Another young branch of Siberian industry, the chemical industry, is also developing with the aid of the latest scientific and technical achievements. Whereas the enterprises of this industry were once concentrated primarily in the Kuzbass region, adjacent to metallurgy and the production of coke for blast furnaces, the gas and oil regions of West Siberia have recently become new centers of the chemical industry. The recovery of large quantities of oil and gas predetermined the location of large chemical and petrochemical plants nearby. The economic expediency of this decision is obvious: There is no need for sizeable expenditures on the transport of heavy and cumbersome raw materials, and more compact production with no waste products has an impact 6-8 times the value of the raw materials used.

The construction of two huge petrochemical combines was scheduled for the current 5-year period in Tomsk and Tobol'sk, as close as possible to oilfields. The final start-up of the enterprises will take place later, but their collectives planned to produce the first items this year.

The Tobol'sk Chemical Complex will become a large center for the production of synthetic rubber, with volatile natural gasoline as the raw material. The first section of the Tobol'sk combine will produce isoprene and butadiene, and these will be used in the manufacture of rubber. During the second stage of the Tobol'sk project, the complex will produce surfactants, alcohol, benzol, polyethylene, polypropylene, protein-vitamin concentrates and so forth. The third section will consist of an oil refinery for the production of high-quality motor oil and fuel. The list of production areas alone attests to the grand scales of the construction project. A new city will rise next to old Tobol'sk to serve this complex.

To a considerable extent, all of this is already being carried out on huge construction sites. More than 600 million rubles has been invested in the project in the current five-year plan. The first facilities are already beginning operations, and long before the entire project has been completed consumers will receive the first products from the central gas separator, which will process volatile natural gasoline.

The construction of the Tomsk Petrochemical Combine has progressed even further. The first section of the enterprise, the polypropylene production division, is being prepared for the final start-up and regulating operations. Just the priority complex of the combine's first section required half a billion rubles in capital investments. And these investments must be recouped as quickly as possible. This year the Tomsk workers plan to produce the first 6,000 tons of propylene, and next year it will be the turn of another important product--methanol. Strong transparent film, plastic pipe, insulation material, household items, machine parts, building structures and polymer resins will all be produced with the aid of initial material from the petrochemical complex in Tomsk.

A characteristic feature of these huge construction projects in the Soviet petrochemical industry is the use of the highest achievements of scientific and technical progress. Here, just as in many other locations, the communist party line of production intensification is being put in practice. The latest technology and maximum automation are sharply reducing the number of workers. Another important requirement of the present day is also being strictly met--an effective and reliable system of environmental protection. It is not a surprising prediction that the petrochemical combines in Tomsk and Tobol'sk will pass the entrance exams for the 21st century.

The development of Siberian industry acquired great nationwide and even international significance long ago. The extractive industry has firmly established itself as a stable supplier of export commodities. The coal, oil, gas and lumber now extracted and produced in Siberia occupy a prominent place in Soviet foreign trade. From year to year, the products of the processing industry take on more importance. It is obvious that the petrochemical industry will also have a positive effect in this respect.

Siberia also has enterprises which had already become unique symbols of the international cooperation of the USSR during the construction stage. A place of honor must be given to one of the most outstanding projects--the Ust'-Ilimsk Timber Industry Complex. This project is extremely indicative both from the standpoint of the organization of comprehensive production and as an example of the coordination of the objectives of international cooperation with the planned development of the resources of the USSR's almost inaccessible eastern regions.

The timber industry complex in Ust'-Ilimsk will process 6.3 million cubic meters of wood a year. This raw material will be used each year in the production of up to 500,000 tons of bleached sulfate pulp, 1.2 million cubic meters of sawn lumber, 250,000 cubic meters of particle board, rosin, turpentine and other products--20 in all.

In accordance with an agreement signed in 1972, the USSR, Bulgaria, Hungary, the GDR, Poland and Romania are participating in the construction of the pulp mill, with an operational volume and shipments valued at around 330 million transferrable rubles. The forms of participation by various countries in this project were defined in advance. The USSR, for example, provided the planning documents, technological equipment and materials, construction machinery and devices for the plant and also carried out the construction and installation work; Bulgaria provided the cable, the siding and roofing materials, electric trolleys and self-propelled trolleys; Hungary provided the ventilation equipment, some of the structural elements, storage facilities, doors and window casings; the GDR provided electrical equipment, refrigeration equipment and metal structures. When the plant is working at full capacity, the participating countries will receive around 200,000 tons of pulp a year from the USSR for a long time. Shipments will be distributed in accordance with the proportional participation in the project.

There is also another extremely interesting feature of the construction of the Ust'-Ilimsk complex: Integrated socialist cooperation was accompanied here by compensatory transactions with enterprises in the capitalist countries. On the compensatory basis, the USSR bought technological equipment for the complex from French, Swedish and Finnish firms. In this way, the highest form of international economic relations between socialist countries is interacting closely with one of the best forms of cooperation between states with differing social systems in accordance with the principles of peaceful coexistence.

The 20,000 members of this construction collective celebrated a noteworthy event in November 1979: the first scouring of pulp, which began the process of cultivating activated sludge--the special microorganisms which process production waste--in purification equipment. This year the continuous scouring of unbleached pulp will begin, and then the final product--bleached cellulose--will be manufactured. All of this will constitute a serious contribution by the Siberian workers to the implementation of 25th CPSU Congress decisions regarding the essential completion of the Bratsk--Ust'-Ilimsk territorial production complex in the 10th Five-Year Plan.

Naturally, the enterprises listed above are only part of the present industrial potential of Siberia and the Far East. Dozens of other plants and factories are also being erected in all branches. During the first 3 years of the five-year plan, 120 new enterprises, shops and production units began operating just in Novosibirskaya Oblast.

The new construction projects in Siberia include many plants and factories for the production of consumer goods. One of these, for example, is West Siberia's largest knitted outerwear factory in Ulan-Ude, with an annual output of 580,000 items, which began operating last summer. A new mechanical bakery is now offering its wares in Irkutsk. Many clothing enterprises have been built, production has been expanded at the radio plant in Berdsk and the refrigerator plant in Krasnoyarsk, and so forth.

All of this corroborates the view of Siberia and the Far East as established industrial regions with a high concentration of modern production units. The days of "empty spaces" and zones of purely agrarian labor are gone forever. Socialism has radically transformed this bleak but generously endowed land.

Even a brief analysis of the development of the east indicates that a strong processing industry has grown up here alongside the huge raw material base, and that production growth in both spheres is being accomplished primarily through the incorporation of the achievements of scientific and technical progress.

The intricate structure of production in the eastern regions displays many interdependent relations and direct and reciprocal connections. The saturation of production areas filling the most important national economic needs with the latest equipment and outstanding personnel is also raising the technical level of the entire infrastructure--transportation, public utilities, social and cultural facilities and so forth.

The national economy is investing more in the Siberian economy because much of the work here had to begin from scratch. The optimal scales of production under present conditions with large series of specialized or comprehensive production units also presupposed large expenditures. At the same time, the modern enterprise, built according to the most efficient design, recoups investments a hundredfold and serves as a basis for the development of other production units.

The return on investments in eastern industry will constantly grow as the use of the assets established here increases. The capital investments of the 10th Five-Year Plan will strengthen the foundation for the development of the Soviet economy in accordance with the plans which will be examined and adopted at the 26th CPSU Congress.

On a Par with Industry

Other branches of the economy of Siberia and the Far East are developing successfully along with industry. The rising level of agricultural production is establishing the prerequisites for the resolution of an important national economic problem--the total self-sufficiency of the eastern regions in regard to food supplies and the shipment of foodstuffs to other zones from this region.

The vast territory of Siberia and the Far East with its variety of natural conditions makes it difficult to cite any kind of average arithmetical figures to convey a general picture of the state of rural Siberia and the dynamics of its development. A good example of this can be seen in the degree to which the population is supplied with the most important element of agricultural productive forces--fertile land. Whereas there are approximately 2 hectares of plowland per inhabitant in Altayskiy Kray in the south, the figure is only half a hectare on Sakhalin, and productive soil can only be measured in square meters in the north, where oil and gas production is concentrated,in the BAM zone.

Work is being conducted to increase the area of farmland in all regions of Siberia and the Far East. Even here, agriculture is distinguished by the extensive use of technical equipment, without which it would be impossible to cultivate millions of hectares of virgin land or utilize the new land wrested from swamps and taiga. Just in Altayskiy Kray, for example, where more than 4.5 million hectares of land is used for the cultivation of grain, farmers are using around 48,000 tractors, 25,000 combines, 14,000 harvesters and a multitude of other pieces of technical equipment. As a result, labor productivity in Siberia is 25 percent higher than the national average.

The southern regions of Siberia have long been known as large producers of grain. Powerful equipment is used here in conjunction with the latest scientific agricultural methods of combating soil erosion and the extensive employment of scientific achievements. The use of highly productive strains developed by Siberian selection workers--Novosibirskaya-67 and Omskaya-9 wheat and Belozernyy barley--is helping to augment the yield. During years of unfavorable weather conditions in the European regions of the USSR, Siberia has more than once been of great help to national agriculture. This was the case, for example, in 1975 and 1979.

The growth of grain production is now primarily due to higher yields. In Omskaya Oblast, for example, the grain yield was around 1.8 million tons at the beginning of the 1960's, but the same plots have yielded around 3.5 million tons in the current 5-year period. The yield has doubled in Altayskiy Kray, Amurskaya Oblast and other kraya, oblasts and autonomous republics in Siberia. Some farms in Altayskiy Kray and Omskaya Oblast are gathering 30-40 quintals of winter crops from each hectare.

First Secretary A. Chernyy of the Khabarovskiy CPSU Kraykom cited the following indicators of the yield of this kray's fields in a newspaper article: The average grain yield in the kray was 7.1 quintals per hectare in the first year of the Ninth Five-Year Plan, but the kray had already approached the 16-quintal mark during the current 5-year period; the productivity of the potato hectare rose from 35 to 100 quintals and the yield of the vegetable hectare rose from 37 to 150 quintals.[19]

We can confidently say that the Siberian and Far Eastern lands are far from the upper limits of their potential, and coming years will be marked by a considerable increase in the gross yield of grain and other products. The reserves for this exist in abundance. First Secretary N. Aksenov of the Altayskiy CPSU Kraykom explained, for example, what the kray would gain from a stronger technical base. In its present state, harvesting work in the kray takes a month or more, but if grain is allowed to overripen for more than 20 days, harvest losses will exceed 30 percent. The prevention of this alone would result in additional stocks of at least a million tons of grain in Altayskiy Kray.[20]

Land reclamation, the more extensive use of mineral fertilizers and a rise in the level of technical equipment in accordance with the decisions of the July (1978) CPSU Central Committee Plenum should guarantee a considerable increase in the productivity of fields throughout our nation, including fields in Siberia and the Far East.

Major problems are also being solved in animal husbandry, primarily through the introduction of industrial methods. In the last 2 years alone, such large enterprises began operating as the Amursk Poultry Factory, which will raise 6 million broilers a year, the Khabarovsk Poultry Factory, a new complex on the Luzinskiy Sovkhoz for the maintenance of 170,000 hogs in Omskaya Oblast and other enterprises. Large-scale operations have been planned to heighten the productivity of livestock, which will considerably increase the output of meat, milk and other animal husbandry products for cities in Siberia and the Far East.

Persistent work is being performed to move many crops to the northern regions to, on the one hand, improve the supplies of the rapidly growing population here and to keep it from migrating and, on the other, to relieve the economy of the need to transport food over long distances. Sakhalin and Kamchatka have become stable producers of potatoes and vegetables. From here, the products are delivered fresh to Magadan and Chukotka. The Yakut ASSR is relying more and more on its own potato and vegetable plantations. In the last 10 years, plots used for the cultivation of potatoes have been enlarged 2.4-fold in this republic, and vegetable plantations have been enlarged 1.6-fold. In the final year of the five-year plan, 100,000 tons of potatoes and around 30,000 tons of vegetables are to be gathered here, and, after all, it was not that long ago that these crops were not grown here at all.

With the aid of accumulated experience, the BAM builders are taking steps to develop the zone adjacent to the trunk line for agricultural purposes. Last year the first harvest holiday was celebrated on the new Magistral'nyy Sovkhoz in the western part of the construction zone. In all, the BAM zone will have a number of farms with 130,000-150,000 hectares of agricultural land, including 45,000-60,000 hectares of plowland.

As Corresponding Member of VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin] V. R. Boyev noted in his report at the applied science conference on "Man on the BAM Route," these farms could obtain up to 100-160 quintals of potatoes, 130-420 quintals of vegetables and large quantities of fodder from each hectare of plowland. According to scientists from the Siberian branch of VASKhNIL, the problem of supplying the inhabitants of the BAM zone with food will be solved in three ways: the organization of bases for perishable products in the locations of consumption, the organization of supply bases in adjacent regions, and the production of goods in more remote regions. Intensive work is already being performed in all of these areas.[21]

Just as around the BAM route, at least small-scale farming is being organized wherever industrial construction is going on. Some of these farms have accumulated a great deal of experience and are making considerable progress. The Noril'skiy Sovkhoz at the North Pole, for example, is obtaining 20 kilograms of cucumbers from each square meter of hothouses a year. A hothouse combine with an area of 35 hectares is being built next to the leading construction project in Tomskaya Oblast--the Tomsk Petrochemical Combine. Here, 10,000 tons of vegetables will be grown each year. Even before the construction work has been completed, individual sections will begin to supply the city with cucumbers, onions and tomatoes. Fresh vegetables are becoming a common sight on the tables of Tomsk inhabitants even on the coldest winter days.

This combination of progressive production and well-organized services for the workers is natural for the socialist order, where the development of productive forces is not a goal in itself and not a means of increasing someone's profit, but a prerequisite for a rise in the workers' standard of living.

The development of the transportation system--an important link in the settlement of remote regions and the continued progress of the entire Siberian and Far Eastern economy--is confidently staying in step with industry. It does not seem long since the first volunteers left cities in the European center of the USSR to go and build the Baykal-Amur Railroad, but now the BAM newspaper, which is published in the city of Tynda, is already printing the schedule of passenger trains on the railroad. An express train has been making regular runs between Moscow and Tynda since last June, when a total of 1,295 kilometers of track had been laid. Trains are departing from Tynda for Urgal and from Urgal for Komsomol'sk-on-Amur.

The scales of the work here provide ample grounds for calling the BAM the construction project of the century. When the northern section of the meridional branch of the Tynda-Berkakit trunk line, stretching 220 kilometers, began permanent operations in December 1979, the builders summed up the results of their work: They included the laying of a road bed with more than 25 million cubic meters of soil, the construction of 1,320 meters of tunnels and 280 other man-made structures, the laying of 257 kilometers of main and station track and 25 kilometers of track to the Neryungri coal basin, the construction of 7 station villages, 100,000 square meters of housing, schools, kindergartens and hospitals, and so forth. The other sections of the railroad required the same amount of track-laying and construction work.[22]

After the Tynda-Berkakit line had been completed, the so-called "BAM Minor" was completely ready for operations. This year it will already be used for the transport of 2.5 million tons of Yakut coal, which has been earmarked for consumers in the USSR and abroad.

Along the BAM route, where 56 stations, 10 roundhouses and 6 car depots will be located, preparations are being made for traffic control services and some of the builders are mastering a new profession as service monitors. On "BAM Minor," where almost 2,000 railroadmen are employed, individual links of the entire railroad collective, which will number more than 40,000 workers, are being tested.

Around a million people are now living and working in the BAM zone, and steps will be taken to attract another million to settle in 50 industrial centers here and to develop the resources of the zone.

It is difficult to predict the projects the BAM collective will work on after this railroad has begun operating, but one thing is clear: The construction organizations which have been established here are capable of building the road to Yakutsk and extending it to Magadan, which was proposed earlier. Just as the construction collectives of the first electric power stations on the Angar and Yenisey, the BAM builders will go to new regions and will put new resources into national economic circulation in accordance with five-year plans and party decisions.

Despite the majestic scales of the BAM project, it will not complete the development of the transportation system in Siberia and the Far East. What is more, this is not the only railway project of the 10th Five-Year Plan. The Tyumen'-Tobol'sk-Surgut-Urengoy trunk line with a branch to Nizhnevartovsk is being constructed just as quickly. A thousand and a half kilometers of track will connect oil and gas deposits here with the existing Trans-Siberian Railway.

By the beginning of the 10th Five-Year Plan, the trunk line called the "Siberian Meridian" was extended to Tobol'sk, and in 1977 it reached Surgut. This is a total of over 700 kilometers. The 25th CPSU Congress decisions set the task of "beginning the construction of the Surgut-Urengoy railroad." The shock labor of construction workers made it possible to go even further: The builders promised to open the entire route to traffic all the way to Urengoy by 7 November 1980. In this way, this party congress assignment was also overfulfilled.

The network of pipelines, which have taken on most of the workload of transporting Siberian oil and gas, is growing. In Tyumenskaya Oblast, 7,500 kilometers of gas and oil supply and industrial pipelines were put in operation just since the beginning of the current five-year plan. More than 20 new oil and gas deposits are now connected with the long-distance transport system. Outside of this oblast, the gigantic Surgut-Polotsk pipeline, 3,300 kilometers in length, has been laid. The 1,700-kilometer Nizhnevartovsk-Kuzbass gasline has been turned over for operations.

The volume of work connected with these construction projects is exceptionally great. The best equipment is being used here. The most powerful tractors are interacting with helicopters, which often perform the functions of trucks and cranes. The cost of 1 kilometer of a modern gas supply line can reach a million rubles, and the cost of building one section of the gasline extending from Tyumen' to the European part of the nation is at least 2.5 billion rubles. These figures provide some idea of the scales of the work and of the transformations brought about by each new project.

Siberia is being filled with the most modern means of transport so quickly that it seems like a race against time to speedily reach the heights of development. This applies to more than just the railroads and pipelines. New river and sea ports are being built, including Vostochnyy Port, which will be the nation's largest sea port. New air routes are being established; more than 200 of the approximately 900 daily passenger flights out of Moscow have their final destination in a Siberian or Far Eastern city. Urban transport is also changing: The first subway in Siberia is being built in Novosibirsk.

Industry is growing, agriculture and the transportation network are getting stronger and the life of the people in Siberia and the Far East is also changing. Most of the 136 cities born in the USSR during the Ninth and 10th five-year plans are located in the eastern regions. They include Nizhnevartovsk, Nadym and Labytnangi in Tyumenskaya Oblast, Strezhevoy in Tomskaya Oblast, Ust'-Ilimsk in Irkutskaya Oblast, Tynda in Amurskaya Oblast, Sayanogorsk and Sosnovoborsk in Krasnoyarskiy Kray, Amursk in Khabarovskiy Kray and Neryungri in the Yakut ASSR.

Siberia and the Far East have become the regions with the most dynamic population growth. Whereas population growth between the 1970 and 1978 censuses was measured at 6 percent in the Russian Federation as a whole, it was 10 percent in the eastern regions and it was 32-34 percent in Magadanskaya, Kamchatskaya and Tyumenskaya oblasts.

The people of Siberia and the Far East will welcome a great and important event in the life of our nation--the 26th Congress of the Communist Party of the Soviet Union--in an atmosphere of progress and success in the development of all branches of the economy. Work reports to the congress will tell of the many great feats performed in the oblasts, krays and autonomous republics of Siberia and the Far East. These successes conclusively prove that the workers of these regions are capable of accomplishing new and even more meaningful tasks in the coming 5 years to aid in consolidating the might of their socialist homeland.

FOOTNOTES

1. "Materialy XXV s"yezda KPSS" [Materials of the 25th CPSU Congress], Moscow, 1976, pp 175, 152.

2. Ibid., p 226.

3. SOTSIALISTICHESKAYA INDUSTRIYA, 21 May 1980.

4. "Materialy XXV s"yezda KPSS," p 226.

5. EKONOMICHESKAYA GAZETA, 1979, No 24.

6. NEFTYANOYE KHOZYAYSTVO, 1979, No 11, pp 5-9.

7. "Narodnoye khozyaystvo SSSR v 1978 g. (Yezhegodnik TsSU)" [The National Economy of the USSR in 1978 (Almanac of the Central Statistical Agency)], 1979, p 144.

8. Ibid., pp 547-551.

9. For more about the international aspects of Siberian development, see PROBLEMY DAL'NEGO VOSTOKA, 1979, No 3.

10. "Materialy XXV s"yezda KPSS," p 176.

11. Ibid., p 179.

12. IZVESTIYA, 12 May 1978.

13. "Materialy XXV s"yezda KPSS," p 179.

14. IZVESTIYA, 6 April 1979.

15. EKO, 1979, No 11, p 87.

16. "Materialy XXV s"yezda KPSS," p 179.

17. IZVESTIYA, 7 April 1977.

18. "Materialy XXV s"yezda KPSS," p 181.

19. PRAVDA, 16 March 1980.

20. SEL'SKAYA ZHIZN', 8 February 1980.

21. BAM, 6 April 1979.

22. Ibid., 4 January 1980.

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DATA ON GAS-BEARING DEPOSITS IN EASTERN KUBAN BASIN

Moscow NEFTEGAZOVAYA GEOLOGIYA I GEOFIZIKA in Russian No 8, Aug 80 pp 2-4

[Article by V. A. Nikolenko, Maykop Drilling Operations Administration, Krasnodarneftegaz Association: "New Data on Occurrence of Oil and Gas in the Jurassic in Deep-Subsidence Zones in the Eastern Kuban Basin"]

[Text] New data confirming excellent prospects for finding oil and gas in Jurassic subsalt formations in the Eastern Kuban Basin have been obtained in the Koshekhabl'skaya and Kuznetsovskaya areas.

The Koshekhabl'skaya structure is located in the central, deeply-subsided portion of the Eastern Kuban Basin (Figure 1) and comprises a large double-plunging anticline with a strike close to north-south, measuring 6 x 12 km on the closed structure contour (Oxford seismic surface) of -4900 meters. The strata on the eastern limb dip at 15-20°, on the western -- 10-12°, with an uplift amplitude of 300 meters. It is characteristic that the fold can be traced on the basis of seismic investigation figures through Middle and Lower Jurassic formations with similar dimensions in area and altitude. The structural plan of the Lower-Middle Jurassic fold corresponds to the Upper Jurassic (Oxford).

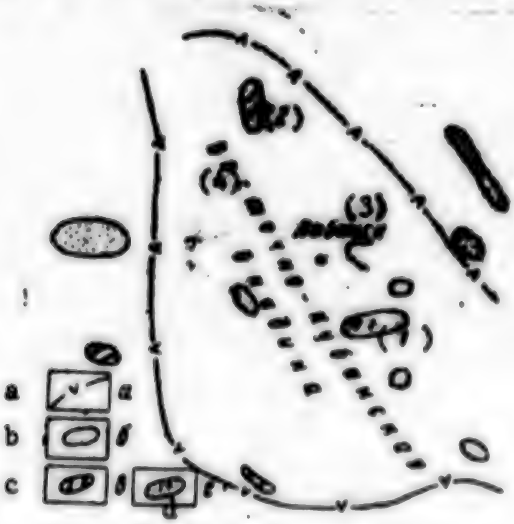

Figure 1. General Diagram of the Eastern Kuban Basin

Key: a. boundary of salt-bearing formations; deposits: b. gas, c. oil and gas, d. gas condensate (1 -- Kuznetsovskoye, 2 -- Koshekhabl'skoye); 3. Labinsk; 4. Eastern Kuban Basin

Neogene, Paleogene, Cretaceous and Jurassic (proceeding downward) formations are involved in the structure of the area. In the Jurassic one can isolate the variegated Tithonos sequence, the saliferous Kimmeridge complex, and subsalt Jurassic formations -- from Oxford and older. The Paleozoic basement rocks lie at a depth of approximately 7,000 meters.

Commercial exploration of the Koshekhabl'skaya area began in 1972 with the drilling of Well No 1 into the crown. This well was sunk to a depth of 5,122 meters (the top portion of the Calloway beds). At this level there occurred an uncontrolled high-pressure discharge of gas from Oxford limestones. After this, extensive exploratory drilling was performed in this area to determine the presence of oil and gas in the Oxford-Calloway beds. A total of six wells have been drilled in this area up to the present time, with bottoms from 5,090 (Well No 4) to 5,500 meters (Well No 5); two of these were abandoned for technical reasons. For a number of technical reasons, for a long time the wells were not tested for flow; only recently have tests been performed to estimate the presence of commercial quantities of oil and gas in the subsalt Jurassic.

The top of the promising Oxford beds occurs in this area at a depth of from 4,850 to 5,040 meters. In the upper part of the column (a thickness of 70-80 meters), the Oxford is composed of dark-gray argillaceous limestones and marls. Carbonate content of the rocks ranges from 46 to 74 percent. The reservoir properties of the rocks, on the basis of core samples, are poor: porosity ranges from 0.5 to 3.6 percent, and permeability -- 0.1-0.2 md.

The lower productive part of the sequence (150-160 meters in thickness) has a more favorable facies composition and texture of limestones represented by organogenous-clastic, dolomitized, granular and finely-platy varieties. Carbonate content of these rocks as a rule comprises 80-90 percent. Core samples indicate pores measuring from 0.1 to 1.5 mm, and interstices -- 1-1.5 mm. In Well No 1 a core was brought up from a depth of 4,957-4,965 meters, consisting of a brecciated mass of limestone and dolomite fragments. Reservoir properties, based on core samples, vary from well to well within the following limits: porosity ranges from 0.4 to 21.6 percent in Well No 1, 0.7-4.8 percent in Well No 2, 0.5-4.9 percent in Well No 3, 0.1-15.1 percent in Well No 4, 0.5-13.7 percent in Well No 5, and 0.2-12 percent in Well No 8. The average porosity factor is 4-6 percent on the basis of acoustic studies. Permeability, on the basis of core samples, rarely exceeds 0.5-1 md, and values of 3-5 and even 14.8 md (Well No 5) are noted in isolated instances. Presence in the high-ohm limestone sequence (ρ_k=100-200 ohmm) of intervals with diminished specific resistances (ρ_k=20-25 ohmm) with an elevated neutron-gamma-ray logging value, with uniform gamma-ray logging record, indicates development of fracture-type reservoirs in the geologic column. Nonuniform distribution of fracture-type reservoirs in the carbonate sequence is also indicated by meter-by-meter recording drilling time. Time required to drill through one meter of rock varies along the column from 20 to 70 minutes. Limestone jointing is also determined by means of core sample data. Thus Oxford reservoir rocks possess complex structure; their type is determined as jointed-cavernous-porous.

The Oxford beds were sampled in four wells (wells No 2, 4, 5, and 8); the entire Oxford sequence was not sampled, for a number of technical reasons, and therefore one cannot judge the actual capacitance properties of the limestones with complete certainty. Commercial-quantity flows of gas were obtained in all sampled wells.

Formation pressure ranges 710-730 kg/cm^2. The specific gravity of the gas, by air, is 0.610 g/cm^3, and methane content is 98.7 percent. The gas-bearing level, according to sampling data on wells situated on the crown (wells No 4 and 8) and on the limbs (wells No 2 and 5) of the uplift, totals 200 meters. Gas-water contact remains beyond the limits of the sampled wells.

Wells No 2, 5, and 8 struck Calloway beds at depths of from 5,000 to 5,190 meters; only Well No 5 ran through practically the full profile (5,190-5,500 m). The Calloway stage contains claystones, sandstones, and siltstones.

Sandstone-siltstone beds possess poor reservoir properties; their porosity, based on core samples, ranges from 0.4 to 6 percent, and reaches 8-13 percent only in isolated instances. According to acoustic data, $K_{п}$=3-8%. Permeability as a rule does not exceed 1-1.5 md. Areas of fractured reservoirs are recorded in core samples. The sandstone-siltstone strata were sampled in wells No 2, 5 and 8; commercial-quantity flows of gas and condensate were obtained in all instances. The specific gravity of the gas, by air, is 0.68 g/cm^3, and methane content is 94 percent. The specific gravity of the condensate is 0.834 g/cm^3, with condensate content running to 0.3 kg per cubic meter of gas. The Calloway sandstone-siltstone strata, interbedding with claystones, show practically no intercorrelation. Sampling in Well No 5 indicated commercial quantities of gas in sandstones in depth interval 5,400-5,340 meters, with water saturation of sandstones in the interval 5,320-5,260 m, that is, the top of the producing formation is 10 meters below the base of the water-bearing formation. Commercial-quantity flows of gas with condensate were obtained in wells No 2 and 8 in the intervals 5,228-5,195 and 5,176-5,108 meters respectively. It is probable that the Calloway sequence contains a number of independent, hydrodynamically unconnected pools, the distribution of which is controlled by the lithologic inhomogeneity of the beds. Much remains unclarified in the structure of the Calloway reservoirs, due to limited information on the geologic section on the basis of drilling materials, but the sandstone reservoirs are unquestionably gas-saturated. The gas-bearing level totals approximately 300 meters on the basis of sampling data.

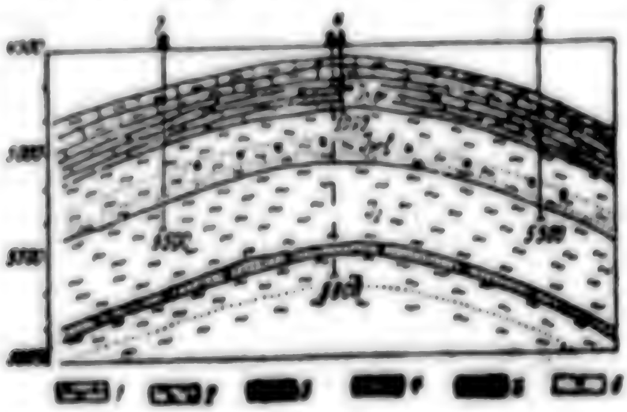

Figure 2. Latitudinal Geologic Section of the Koshekhabl'skoye Field

Key:

1. Limestones
2. Claystones
3. Sandstones
4. Producing beds
5. Expected productivity of the beds
6. Projected well

To the southeast of the Koshekhabl'skoye uplift (at a distance of 50 km), in the axial zone of the Eastern Kuban Basin, in the Kuznetsovskaya area (structure dimensions 9 x 4 km, amplitude approximately 100 m), during the drilling of Well No 3, gas with condensate was ejected on reaching a depth of 4,631 meters, in greater volume than in Well No 1, Koshekhabl'skaya, on the Kuban. It is probable that Well No 3 had tapped Middle Jurassic (Bath-Bayeux) sandstone beds registered in the adjacent Labinsk area (Well No 20). The expected total thickness of the limestones is not less than 40-50 meters; judging from the rate of flow, their reservoir properties are fairly good. At the present time four wells are being drilled in this area. As noted above, the Koshekhabl'skaya fold is mapped through Lower-Middle Jurassic formations; its structural plan corresponds to that of the Upper Jurassic (Oxford). The amplitude of the uplift is 300 meters at seismic surface I_2. In light of the above it would be advisable, alongside building up the longitudinal and transverse profiles of the delineating wells, to sink an exploratory well in the crown of the Koshekhabl'skoye uplift with the objective of drilling into and estimating the saturation of the Bath-Bayeux sandstones.

The Oxford sedimentary beds in the Kuznetsovskaya area show little promise, in view of the poor reservoir properties of the pelitomorphic compact limestones, while the Calloway beds, consisting of sandstone-argillaceous rocks, have clearly been insufficiently studied. The substantial dimensions of the structures and the interbedding character of the structure of the Calloway sandstone-argillaceous rocks attest to the possible presence of oil and gas pools of the structural-lithologic type on the flanks of the uplift. This circumstance dictates the necessity of thoroughly sampling all Calloway sandstone-claystone beds without exception.

Thus the presence of commercial quantities of gas (with condensate) in Oxford-Calloway beds on the Koshekhabl'skaya structure in the deep-subsidence zone of the Eastern Kuban Basin, in the interval 4,850-5,400 meters, and in Middle Jurassic beds on the Kuznetsovskoye uplift at depths of 4,600-4,700 meters has been proven. Favorable geologic development conditions of this area, promoting the formation and accumulation of hydrocarbons (presence of thick Jurassic oil-source beds, persistent, protracted downwarping of the area, presence of reservoir beds and structural traps), have obtained practical confirmation due to the discovery of the above-named fields. The economic advisability of continuing prospecting and exploration in this area is obvious.

The following recommendations can be made:

1. Continue exploration (seismic exploration and exploratory drilling) activities in the central areas of the Eastern Kuban Basin, with the objective of discovering new uplifts and evaluation of their oil and gas potential.

2. With the objective of mapping the Koshekhabl'skoye and Kuznetsovskoye gas condensate fields, continue exploratory drilling, obtaining borehole profiles transversely to the direction of strike of the structures, with distances of 1.0-1.5 km between holes.

3. In connection with discovery of a Middle Jurassic gas condensate pool in the Kuznetsovskaya area, sink a deep exploratory well (5,800 m) in the crown of the Koshekhabl'skaya fold (Figure 2), drilling into the promising Bath-Bayeux sandstone.

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FUELS

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DATA ON OIL-BEARING DEPOSITS IN TAJIKISTAN

Moscow NEFTEGAZOVAYA GEOLOGIYA I GEOFIZIKA in Russian No 8, Aug 80 pp 24-27

[Article by G. A. Aleksin, K. Kh. Dzantiyev, Yu. S. Yurtayev, and Yu. Ya. Yakovets, VNIGNI, TO VNIGNI (All-Union Scientific Research Institute of Geological Prospecting for Oil, Tyumenskaya Oblast All-Union Scientific Research Institute of Geological Prospecting for Oil): "Geological-Economic Effectiveness of Petroleum Prospecting Activities in Tajikistan and Ways To Increase It"]

[Text] Oil prospecting activities began to be conducted intensively more than a quarter of a century ago in promising areas of the Tajik SSR, following initial discoveries made in the Vakhsh, and subsequently in the Dushanbe and Southern Fergana oil and gas regions. During this time exploration activities have been conducted in 70 areas, in 50 of which efforts were focused on Paleogene, and in 20 -- on Cretaceous and Jurassic formations. Productivity of 15 areas was confirmed, including determination in five areas of the presence of oil and gas in Cretaceous and Jurassic sedimentary sequences. The result was discovery of new areas and sections with proven commercial quantities of oil and gas: Bal'dzhuanskiy in Kulyabskiy Rayon, and Niyazbek-Karakchikumskiy in Yuzhno-Ferganskiy Rayon. At the same time favorable prospects for the majority of areas where potential oil and gas presence was indicated by geological survey and structural drilling was not confirmed by deep wells, which required performance of additional work.

The reasons for the low degree of effectiveness of these activities are due to difficulties in selection of structures concentrating hydrocarbon reserves.

As of 1 January 1979 the list of promising structures in the Tajik SSR contained 120 anticlinal folds discovered by geological survey, structural drilling and geophysical methods. Geological survey has mapped folds primarily on the basis of Paleogene-Cretaceous productive beds outcropping and denuded in anticlinal zones, and less frequently on the basis of the saliferous Jurassic sediment sequence. Each year from four to nine areas were involved in structural drilling, while deep drilling was being performed in only 1-2 areas. Other structures were not mapped, for various reasons. The low degree of efficiency in readying structures for deep drilling by geophysical methods is connected with the complex geologic conditions of southwestern Tajikistan. In the northern part of the republic, detailed seismic exploration, together with deep drilling, have made it possible substantially to increase work effectiveness and efficiency (A. A. Barkhudar'yan et al, 1978; R. U. Kalomazov and V. S. Korobka, 1979). Orientation-parametric drilling has also proven effective in the northern rayons of the republic, where it helped detail not only the structural plan of levels but also helped discover new pools with the first wells (Northern Karakchikum, Madaniyat).

On the list of discovered promising structures, 15 are considered readied, while 16 structures are in the process of deep exploratory drilling. Six structures have been set aside on the basis of exploration results. Six orientation-parametric boreholes are being drilled, while area and detail geophysical work is being performed on the surface and in the holes.

The discrepancy between the list prepared annually and the number of structures involving initiation of exploratory drilling acutely focuses the question of selection of new structures for preparatory work. In connection with this, an appraisal was made of the list of structures (G. S. Volos et al, 1977), for the purpose of preventing cases of exploratory drilling into unprepared or assumed structures (L. M. Saf'yan et al, 1974).

A total of 96 promising structures were discovered at specific levels (Figure 1), including six structures on which drilling is in progress, and four on which work has been discontinued.

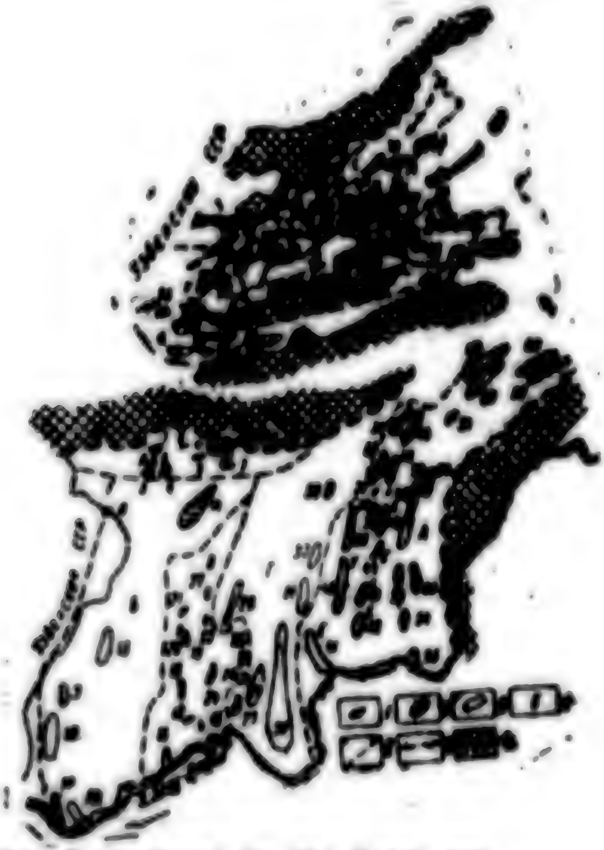

Figure 1. Map of Promising Structures in the Tajik SSR

Key: I -- fields; II -- structures being drilled; III -- promising structures; IV -- signs of oil and gas in boreholes; V -- boundaries of oil and gas accumulation zones; A -- Dushanbe; Б -- Kafirniganskaya; В -- Vakhsh; Г -- Obigarmskaya; Д -- Kulyab; Е -- Northern Fergana; Ж -- Central Fergana; З -- Southern Fergana; И -- Fergana margin; К -- Shakhristanskaya; VI -- boundaries of basins; VII -- Paleozoic framing of basins

Fields and promising local structures: 1 -- Shaambarinskoye; 2 -- Komsomol'skoye; 3 -- Novoabadskaya; 4 -- Khanakinskaya; 5 -- Dushanbinskaya; 6 -- Rokhatinskaya; 7 -- Andygenskoye; 8 -- Kurganchinskoye; 9 -- Sulduzskaya; 10 -- Tuyuntauskaya; 11 -- Koykitauskaya; 12 -- Butyutauskaya; 13 -- Payryagatauskaya; 14 -- Renganskaya;

(Key to Figure 1 on preceding page, cont'd) 15 -- Karadumskaya; 16 -- Kichikbel'skoye; 17 -- Akbashadyrskoye; 18 -- Kyzyltumshukskoye; 19 -- Urtabozskaya; 20 -- Kichikurtabozskaya; 21 -- Severo-Kichikurtabozskaya; 22 -- Pervomayskaya; 23 -- Oktyabr'skaya; 24 -- Donguzskaya; 25 -- Kuykuchakskaya; 26 -- Yuzhno-Donguztyubinskaya; 27 -- Allatauskaya; 28 -- Tabakchinskaya; 29 -- Tereklitauskaya; 30 -- Yuzhno-Karatuskaya; 31 -- Yuzhno-Dzhilanytauskaya; 32 -- Severo-Dzhilanytauskaya; 33 -- Kangurtskaya; 34 -- Gul'darinskaya; 35 -- Beshtentyakskoye; 36 -- Syul'duzinskoye; 37 -- Yuzhno-Syul'duzinskaya; 38 -- Uzunokhorskaya; 39 -- Kyzylsuyskaya; 40 -- Tanapchinskaya; 41 -- Alimtayskaya; 42 -- Khodzhamumynskaya; 43 -- Khodzhasartiskaya; 44 -- Yuzhno-Pushionskaya; 45 -- Severo-Pushionskaya; 46 -- Sayabekskaya; 47 -- Yuzhno-Degimakhmudskaya; 48 -- Severo-Degimakhmudskaya; 49 -- Chil'darinskaya; 50 -- Khamdarinskaya; 51 -- Daraisonskaya; 52 -- Khanabadskaya; 53 -- Tebolyayskaya; 54 -- Kyzylbuynakskaya; 55 -- Shpilyauskaya; 56 -- Kichikteryayskaya; 57 -- Mationskaya; 58 -- Shaklysuyskaya; 59 -- Chorsangskaya; 60 -- Samgarskaya; 61 -- Karamazarskaya; 62 -- Zapadno-Digmayskaya; 63 -- Yuzhno-Digmayskaya; 64 -- Digmayskaya; 65 -- Rukhakskaya; 66 -- Yuzhno-Rukhakskaya; 67 -- Akchopskaya; 68 -- Zapadno-Akbel'skaya; 69 -- Vostochno-Akbel'skaya; 70 -- Kyzyldzharskaya; 71 -- Zapadno-Supetauskaya; 72 -- Vostochno-Supetauskaya; 73 -- Makhramskaya; 74 -- Batyrkurganskaya; 75 -- Auchikalachinskaya; 76 -- Severo-Karakchikumskoye; 77 -- Niyazbekskoye; 78 -- Yuzhno-Niyazbekskaya; 79 -- Vostochno-Niyazbekskaya; 80 -- Madaniyatskoye; 81 -- Vostochno-Madaniyatskoye; 82 -- Severo-Kanibadamskoye; 83 -- Kanibadamskoye; 84 -- Zapadno-Kanibadamskaya; 85 -- Ravatskoye; 86 -- Ayritanskoye; 87 -- Neftesbadskoye; 88 -- Sel'rokhinskoye (Kim); 89 -- Yuzhno-Karchiginskaya; 90 -- Kyzylinskaya; 91 -- Seksarinskaya; 92 -- Tagiakskaya; 93 -- Bakhmal'skaya; 94 -- Rugundskaya; 95 -- Chorbokskaya; 96 -- Kalikhodzhiyskaya

The list of prepared structures can be increased by concentrating efforts on new structures or by repreparing structures in previously studied areas. One must be alarmed in this connection by a trend, noted in recent years, toward decrease in the volume of regional exploration, the purpose of which is to extend operations in new areas characterized by a low level of geological-geophysical study (the Obigarmskaya zone and the eastern areas of the Kulyab megasyncline in Southern Tajikistan; the Central and Fergana margin zone in the northern part of the republic). A comprehensive plan of exploration of the promising Vakhsh trough should be executed. An especially important task is that of substantiating prospects of finding oil and gas in the subsalt Jurassic sedimentary sequence, which is the principal target of exploration in adjacent areas of Uzbekistan and the Turkmen SSR.

Analysis of the effectiveness of work performed during the period of the Seventh through 10th Five-Year plans by the Tajik SSR Geology Administration* attests to certain stability of indices, especially since the beginning of the 1970's, that is, from the time of discovery of the Beshtentyak and Syul'duzy fields (Figure 2).

On the whole analysis of prospecting and exploratory activities in Tajikistan indicates that the reasons for decreased effectiveness of such activities are the following: uneven distribution of exploratory drilling on prepared structures; lack of concentration of exploratory drilling and an increase in the percentage share of exploratory drilling in areas of discovered fields. In southwestern Tajikistan,

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* The Tadzhikneft' Production Association has been conducting exploration activities since 1966.

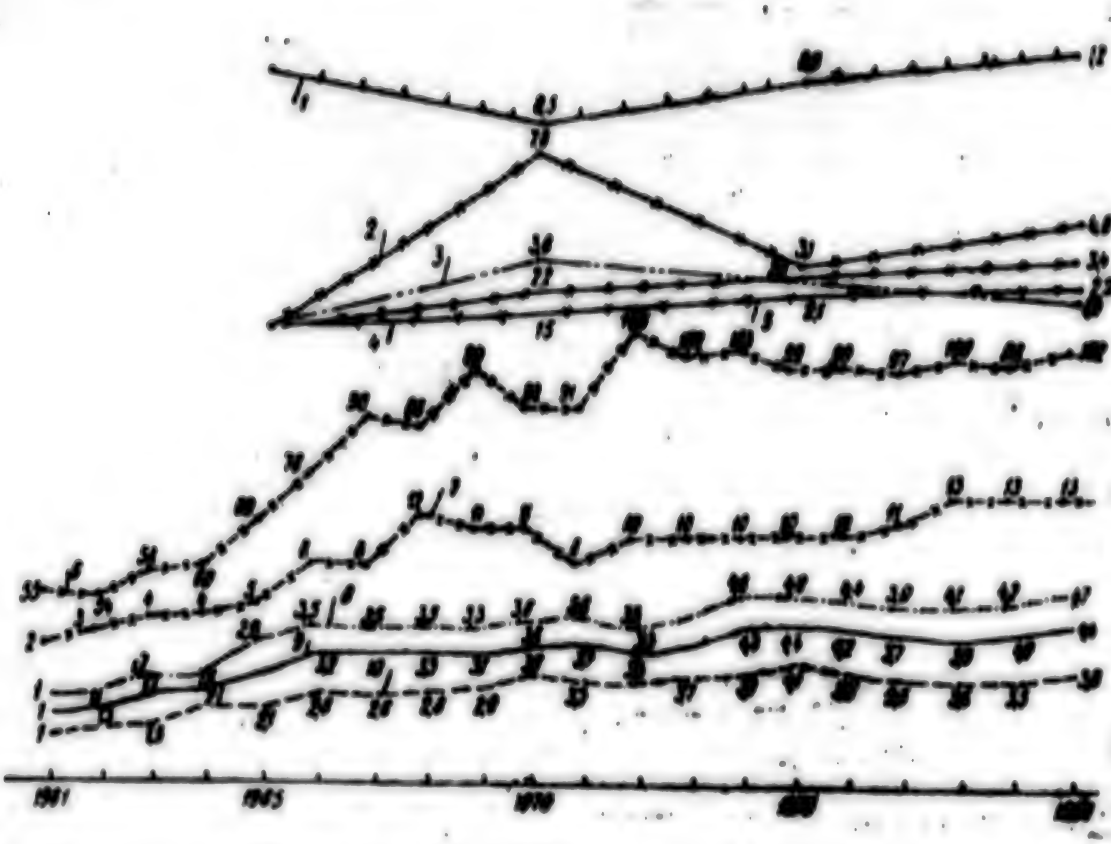

Figure 2. Dynamics of the Oil Exploration Process and Expenditures in the Tajik SSR During the 7th-10th Five Year Plans (in multiple standard units)

Key:

1. Growth of reserves
2. Prime cost per discovered structure
3. Prime cost of increment growth of one ton of standard fuel
4. Prime cost of one prepared structure
5. Cost of assessing a structure by exploratory drilling
6. List of discovered structures at beginning of year
7. List of prepared structures at beginning of year
8. Capital allocations
9. Total expenditures on prospecting and exploration activities
10. State budget appropriations

for example, up to 1960 principal capital investment (53 percent) and volume of exploratory drilling (58 percent) were concentrated in Vakhshskiy Rayon, where two fields were discovered within a comparatively short period of time (2-3 years). At the same time volumes of expenditures and drilling comprised 12 and 14 percent in Dushanbinskiy Rayon, where three out of five prospected structures proved productive. In spite of the fact that the success factor proved higher in this rayon than in Vakhshskiy (0.6 as compared with 0.5), in the following five-year period (1961-1965) volumes of capital investment and exploratory drilling here increased by only 2 and 7 percent. A sharp cutback occurred in Vakhshskiy Rayon: to 21 percent in capital investment, and to 20 percent in drilling volume. Subsequently the bulk of activities began to be concentrated in Kulyabskiy Rayon.

The increase in number of reconnaissance boreholes to evaluate a structure on the basis of the upper discovered level (expenditures increased threefold) did not correspond to the increase in their depth (expenditures doubled).

Failure to observe the phase sequence in activities, both at the beginning (1961) and at the end of the analyzed period (1976-1978), led to unwarranted expenditures at the preparatory and exploration (Beshtentyak) stages.

The concluding stage (exploratory stage) of activities as a rule involves exploratory drilling. For example, with the discovery of just one field in 1971 (Beshtentyak), capital expenditures on exploratory drilling on other structures decreased threefold by 1974 due to increase in appropriations for developmental drilling of this field. A like phenomenon occurred in the preceding years. In the Seventh Five-Year Plan, for example, only 27 percent of capital spending was channeled into prospecting for new fields, while 73 percent of total expenditures was concentrated on already-discovered fields. In the Komsomol'skoye and Shaambarinskoye fields alone the volume of exploratory drilling totaled approximately 100,000 meters, with an average of 6,000 meters for every structure being explored by drilling in southwestern Tajikistan.

In order to achieve accelerated resolution of the problem of oil and gas exploration in Tajikistan, it is essential to implement a number of measures, the most important of which are the following:

expansion of the aggregate of regional and area seismic exploration activities, employing the common deep point method for mapping the surface of specific horizons in Paleogene and underlying beds;

acceleration of geophysical and drilling activities on the Rengan-Dzetymtau uplift -- at present the sole structure in subsalt Jurassic beds in southwestern Tajikistan;

preparation of new structures for oil and gas prospecting in Paleogene beds in the promising Vakhsh, Kulyab, and Central Fergana areas;

expansion of scientific research activities in the area of prediction appraisal of deep-lying horizons and elaboration of scientifically substantiated areas of exploration.

Also directed toward increasing the effectiveness of the entire aggregate of prospecting and exploration activities is the interministerial program of such activties, presently being drawn up by organizations of the USSR Ministry of Geology, Ministry of Petroleum Industry, and Ministry of Gas Industry.

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FUELS

PETROLEUM PRODUCTION IN MIDDLE OB' REGION

Moscow PRAVDA in Russian 31 Jul 80 p 2

[Article by S. Vtorushin]

[Text] Strezhevoy, a city of Siberian petroleum workers, in 1967 resembled a gypsy camp. Not far from the Ob' carpenters erected wood houses on the steep bank. Although by winter the petroleum workers had already moved from tents into railroad cars and huts, the time was difficult. In the entire settlement there was only one dining hall. There was no hospital, club or kindergarten. Parents took children to work with them. The first major building appeared only after several years.

But the people were in high spirits. Now Strezhevoy is one of the most beautiful cities in the Middle Ob' region. It became a base for the exploitation of a whole group of petroleum deposits. From the shores of the Ob' the petroleum workers went forth to remote deposits situated on the banks of the Vakh and Vasyugan.

Cities in the northern part of Western Siberia are developing rapidly. In the years immediately ahead plans call for the construction of 22 major populated places in Tyumenskaya Oblast alone on new petroleum and gas deposits. They are advancing farther and farther into the taiga and tundra. And as a rule long before builders are ready to hand over the first major building, new settlements appear in uninhabited areas.

Geologists recently discovered a petroleum deposit in the cold lands of the Yamal, at the very boundary of the wooded tundra. It was named the Kholmogorskoye deposit. Construction of the city of Khanto began here a year ago. In the future, in addition to petroleum workers, the city will be occupied by gas workers, geologists and construction workers.

"In the long run some 70,000 people will live here," states S. Lego, deputy chief of the "Kholmogorskneft'" Petroleum and Gas Production Administration for major construction. Khanto will become the largest, and indeed, the most beautiful city of the Yamalo-Nenetskiy Autonomous Okrug.

And so it will be. But how many years will it take to erect a modern city amidst the reindeer lichen expanses?

During the two decades which have elapsed since the time of discovery of the first petroleum deposit in Western Siberia, there is much which has changed. House construction combines have been established at Surgut, Nadym and Nizhnevartovsk. Residential buildings have been constructed in a northern variant and there is increased comfort.

But does this mean that the construction of new cities has gone smoothly and that all the problems of creating good living conditions and way of life for northerners have been solved? Not at all. The situation here is far better with respect to industrial construction. During recent years it has been possible to bring about a marked jump in quality. All industrial facilities are now being constructed by prefabrication or unit methods exclusively. Pressure and field pumping stations are being fabricated at factories and are being delivered to site in finished form. It is only necessary to start them up.

Prefabrication has also reduced the time required for the laying of pipelines. This makes it possible to begin the exploitation of a deposit literally on the day following discovery.

But in city construction there have been no innovations. Bricks and concrete, as in the past, have remained the sole construction materials. And they are brought in from far away. By no means all the exploiters of the earth's underground resources have received convenient, warm, easily mobile residences, dining halls and clubs. That is why the country has been forced to exert enormous efforts in order to assist the Siberians.

It is a misfortune that the construction complex of Western Siberia (in contrast to the petroleum and gas industry) is not an integrated undertaking. Whereas the petroleum in the region is produced by a single ministry, residences are erected by 26 departments. For most of them their principal task is industrial, not civil construction. For example, the Ministry of Construction of Enterprises in the Petroleum and Gas Industry was intended as a specialized ministry. It was assumed that its principal task would be the construction of field facilities and the laying of main pipelines. But today it is erecting cities: Surgut, Nefteyugansk, Nadym, Urengoy, Uray. Moreover, it was designated as the chief builder of the city of Khanto. In addition to the Ministry of Construction of Enterprises in the Petroleum and Gas Industry, residences in Tyumenskaya and Tomskaya Oblasts are being erected by the Ministry of Industrial Construction, the Ministry of Power, the Ministry of Construction, the Ministry of Transportation Construction, the Ministry of the Petroleum Industry, the Ministry of the Gas Industry, the Ministry of Geology and many others. Each of them has its own tasks, limited capabilities and its own approach to construction.

The overwhelming majority of the ministries are striving to solve narrow departmental objectives. Whereas the Ministry of Construction of Enterprises in the Petroleum and Gas Industry began to develop a home construction base in Western Siberia from the very first days, the Ministry of Power and the Ministry of Industrial Construction have only recently proceeded to this. Even now they are transporting here panels of houses from other regions of the country.

The so-called "watch" method was adopted several years ago at Tyumen' as the fundamental work principle for new deposits. It was proposed that base cities be constructed on the main transport lines and that "watch" settlements be constructed at petroleum and gas deposits. This afforded a possibility for solving the problem of affording work for second members of families and providing good living and rest facilities for people. But at many deposits the "watch" settlements were transformed into permanent settlements and the base cities still cannot fully solve the problems they were meant to solve.

The reason is that the settlements are not being erected by specialized construction subdivisions, but by those ministries which are conducting work in a particular place. That is why in Tyumenskaya Oblast you will not find a "watch" settlement which could serve as a model. In the overwhelming majority of cases they constitute twenty or thirty railroad cars which have been brought together in a single place.

The "watch" problem has been solved better in Tomskaya Oblast. At the request of the petroleum workers the specialized city builders of Tomsk have planned a "watch" settlement for 3,000 persons in which provision has been made for all the conditions for the normal life and good rest of people. Its construction has begun on the shores of the Vasyugan River.

"This is the first experience," says G. Murav'yev, who heads the Tomsk Territorial Construction Administration. "Now plans are afoot for a factory for the production of residences from light metal construction components. The houses will be many times lighter than large-panel structures."

The factory will produce 100,000 square meters of residential space per year. Using these panels it will be possible to construct not only houses with a height up to four stories, but also dining halls, clubs, stores and polyclinics. Unfortunately, due to the territorial separation of construction ministries the factory will operate only in Tomskaya Oblast. At Tyumen' for the time being there is no talk of such an enterprise.

How can one get underway with the construction of base cities and "watch" settlements in Western Siberia? The answer to this question is exceedingly important because the exploitation of the Baykal-Amur Railroad Line zone and deep regions in the North and East of our country is now developing. Western Siberia can become a good school.

In the initial stage of exploitation of new regions there must be assistance from other regions in the construction of residences and communication lines. That is what is being done now in the Baykal-Amur Railroad zone and in Tyumenskaya Oblast. This is necessary in order to shorten the period of so-called pioneering exploitation and in a short time they will develop their own construction industry base. The construction complex must immediately be formed as an integrated organism. Otherwise it will be impossible to avoid those disproportions which are being observed in Western Siberia. Today many scientists and leading managers feel that there must be a coordinating agency which would bring the construction complex together. It is necessary in order to control the course of events for the purpose of achieving the final goal, not for solving special problems.

Naturally, it would be easiest to raise the question of putting all the organizations concerned with the construction of residences and social culture facilities into the hands of a single department. But it is not so simple to do this, taking into account the existing interdepartmental relationships, tie-in with traditional suppliers, planning institutes and supply bases. The uneven rhythm of construction work can be disrupted even without this.

That is why, in the opinion of specialists, such a coordinating agency could be delegated control over the course of residential and cultural-public facilities and the development of bases for the construction industry in Western Siberia. This makes it necessary to think clearly about its status and prospects. A major scientific research and planning institute must be dedicated to this goal. As is well known, Siberia has its natural peculiarities. However, in the overwhelming majority of plans the local specifics to all intents and purposes are not taken into account. All this leads to increased costs of construction, a lengthening of time required for construction and a reduction in quality.

A coordination of efforts would also help in solving another problem. All Siberia is today constructing living quarters for the exploiters of the underground riches of the North. At Tobol'sk, for example, parts of houses are being received from Omsk. They are being transported to Nefteyugansk from Novosibirsk and to Strezhevoy from Tomsk. There are convenient "roads" for this: the Ob' and the Irtysh. In the industrial south of Western Siberia there are large organizations with a well-developed work force with all the possibilities for broadening of the base of the construction industry.

Today it is obvious that Western Siberia requires a long-range program for the development of the entire construction complex. After all, the need for housing is being felt not only by workers in the petroleum and gas industries, but also by the inhabitants of the agricultural zone. This is necessary in solving a task of enormous national importance -- a marked increase in the production of grain, meat, milk and other food products.

The development of a base for the construction of northern cities until now is being held back by an uncertainty in their future. Many now feel that Nizhnevartovsk, Strezhevoy, Nefteyugansk, Nadym and other cities exist only for transporting petroleum and gas there and then will have no reason to exist. Such a way of thinking of things is erroneous. Gas refining and the electric power industry are developing in the Middle Ob' region. These cities have reliable transportation to the center of the country and they have a permanent population. That is why it is necessary to think of the development of branches of industry with a final cycle of production here. First and foremost -- electric power, petroleum refining and petrochemical industries.

Not one region of the country has been built up with such an intensity as Western Siberia. The transformation of an enormous region is underway. However, accompanying the increase in volumes of construction it is becoming more difficult to control its processes. Many problems have accumulated in the construction complex in Western Siberia which require solutions. It is necessary that this extensive and very rich region be developed still more intensively.

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FUELS

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EXPLOITATION OF NEW PETROLEUM REGION

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 3, Apr 80 pp 2-3

[Article by M. Kh. Khusnutdinov, deputy minister, USSR Ministry of Construction of Petroleum and Gas Industry Enterprises]

[Text] In implementing the resolutions of the 25th Congress CPSU on the further growth of the fuel and energy complex of our country, the personnel of the USSR Petroleum Industry, USSR Ministry of Construction of Petroleum and Gas Industry Enterprises and USSR Power Ministry in 1979 put into operation ahead of time a new petroleum region in Kazakhstan--the Buzachi Peninsula. This peninsula is an extensive lowland with numerous closed depressions which are flooded by the wind-drive waters of the Caspian Sea (so-called "sory"). The air temperature here is from 40-45° to -30°C. There is no fresh water in the region.

The objective for 1979 was the implementation of the chief task: initiation of industrial exploitation of the Karazhanbas and Kalamkas deposits, the production of petroleum and its pumping into the Shevchenko region for further loading into tankers and delivery to the petroleum refineries at Baku.

The Karazhanbas deposit is characterized by a shallow depth of the strata and a high petroleum viscosity (the paraffin and sulfur contents are up to 4 and 2.5% respectively). This deposit can be worked effectively only with the use of thermal methods. The viscosity of the Kalamkas petroleum is considerably lower and at a temperature up to 5°C it can be transported without heating.

The USSR Ministries of the Petroleum Industry, Construction of Petroleum and Gas Industry Enterprises and Power have formulated a complex of specific measures for the accelerated exploitation of the Karazhanbas and Kalamkas deposits. Plans have called for the introduction of progressive technical solutions--prefabricated unit construction of buildings, use of foundations on piles, transfer of technical and engineering communication lines and cable networks onto trestles.

In order to accelerate the growth of the capabilities of the subdivisions of the Ministry of Construction of Petroleum and Gas Industry Enterprises working on the Buzachi Peninsula, construction and assembly organizations of the branch have been drawn from other regions of the country.

The linear part of the Kalamkas-Karazhanbas-Shevchenko petroleum pipeline was constructed by the Sredazneftegazstroy Trust of the Glavtruboprovodstroy. The Kalamkas pumping station was constructed by subdivisions of the Shatlykgazstroy Trust. The Karazhanbas pumping station was constructed by the Soyuzgazpromstroy Combine. Welding and assembly work along the greater part of the main petroleum pipeline, at pumping stations and on field facilities was carried out by the Sredazneftegazmontazh Trust. Electrical assembly work and work on control-measuring instruments and apparatus was carried out by the organizations of the Glavneftegazelektrospetsstrov. Workers of Mangyshlakneftegazstroy were responsible for the final finishing-up of work on the fields, erection of protective structures against wind-induced rises in water level (dikes), laying of lines for the delivery of drinking water, construction of industrial bases for the Ministry of the Petroleum Industry and the Ministry of Construction in the Petroleum and Gas Industry, general construction work on four electric power substations for the USSR Power Ministry. The "watch" settlement in the neighborhood of Kalamkas deposit was constructed by organizations of the Ministry of the Petroleum Industry and the Mangyshlakneftegazstroy, and in the neighborhood of Karazhanbas deposit -- by the Orenburgneftegazstroy Trust and the Turkmenneftegazstroy house construction combine.

Measures were carried out for the further development of production and repair bases, material-technical support, improvement in work and rest conditions for the workers, etc. Much attention was devoted to solution of organizational problems, setting-right of communications, coordination and monitoring of the activity of subdivisions.

The tasks associated with the exploitation of deposits on the Buzachi Peninsula were carried out well and on time by the Glavneftegazsnabkomplekt, Glavneftegazpromstroymaterialy, Administration of Work Personnel and Living Conditions, Sanitary Service and Glavneftegazstroymekhanizatsiya. Unfortunately, serious complaints, especially during the initial period, could be made against the Communications Administration and the Main Workers' Supply Administration.

Thus, a system of measures was carried out making it possible to solve the main problem -- the starting-up of a new petroleum region in Kazakhstan. The Central Committee of the Communist Party of Kazakhstan, the Mangyshlak Executive Committee of the Party and the oblast executive committee were of great assistance in exploiting the petroleum deposits on Buzachi Peninsula.

In accordance with a special decree of the Board of the Mangyshlak Oblast Committee of the Communist Party of Kazakhstan, the Executive Committee of the Mangyshlak Oblast Soviet of People's Deputies and the Collegium of the Ministry of Construction in the Petroleum and Gas Industry, additional measures have been adopted which are directed to a shortening of the times required for the construction of structures in fields, engineering communication lines, residential and cultural-public buildings.

The workers of the Mangyshlakneftegazstroy Trust in time prepared the necessary work resources for the construction of group measuring equipment, pressure pumping stations, petroleum-collection networks, tanks and supplies and electric power substations for the organizations under its supervision. The volume of construction-assembly work carried out by the trust in accordance with the general plan and on its own initiative increased in 1979 in comparison with 1978 by 38 and 47%. The number of workers engaged in construction-assembly operations increased by 200 persons. The coefficient of replacement of the main equipment was 1.6. The output per worker in 1978 attained an equivalent of 11,326 rubles, in 1979 -- 15,263 rubles.

Weekly-daily planning, "selector" communication with all organizations and mobile communication have been introduced at the trust.

The Shatlykgazstroy Trust carried out all work for construction of the Kalamkas petroleum pumping station in only nine months instead of the sixteen months provided for in the norms. The petroleum pumping station was put into operation with the evaluation "excellent." An analysis of the construction and the starting-up of the Kalamkas petroleum pumping station once again confirmed the advantages of the block-assembly method.

The Shatlykgazstroy Trust used the expeditionary-watch method in the construction of the petroleum pumping station. In general, from 120 to 170 men were engaged in the construction of the petroleum pumping station. The work was carried out in accordance with a schedule coordinated with the assembly workers of the Sredazneftegazmontazh Trust and in close interaction with the operating personnel of the Main Administration of Petroleum Transportation of the Ministry of the Petroleum Industry.

The Kalamkas-Karazhanbas-Tauchik-Shevchenko main petroleum pipeline was also laid in a time less than provided for in the norms by the Sredazneftegazstroy Trust. The Kalamkas-Karazhanbas sector was constructed in five months instead of seven as stipulated in the norms. The Karazhanbas-Tauchik-Shevchenko sector was constructed in only nine months (time provided for in the norms -- 11 months).

Initially along the route of the petroleum pipeline plans called for the concentration of five complex flows, but in the course of construction it was found to be desirable to use three flows, completely outfitted with the required equipment. The assembly brigades of the Sredazneftegazstroy Trust -- the general contractor -- constructed a sector of the pipeline (40 km) by the so-called complex method, which made it possible to adhere to the necessary work rate. The crossings over artificial and natural barriers, especially near Shevchenko, were constructed by specialized crews -- advancing insulation-installation columns.

Along its route the pipeline crosses more than 80 ravines with a width from 200 to 800 m and on the approach to Shevchenko crosses 14 roads, electric cables and communication cables and more than 20 pipelines of different types. A total of 37 km of earthen dams were constructed for laying the pipeline in solonchak-like ground and sand cushions were laid in rocky ground. This required that dump trucks transport more than 1.2 million cubic meters of ground.

In constructing the pipeline use was made of the experience accumulated in the branch in the cleaning of a cavity, testing of individual sectors, beginning from the head sector, and expulsion of water by petroleum.

The beginning of working of the Kalamkas deposit and the technologically necessary accumulation of petroleum in the tank farm and the Kalamkas petroleum pumping station made it possible to match (that is, to conduct parallel) work on the testing and filling of the pipeline with petroleum and the expulsion or forward movement of water for the testing of subsequent sectors. This was especially necessary under desert conditions and in the absence of water even for testing. The filling of the pipeline during the warm season of the year made it possible to get by without the heating of the petroleum.

The filling of the pipeline with petroleum was a singular "catalyst," an additional accelerator of work on the entire complex, since it marked the beginning of a continuous process -- the production of petroleum in the new deposit.

The petroleum pipeline was put into operation with a complex of electrochemical protection structures (26 posts for telemechanical monitoring and control and a 6-KV overhead line were constructed and 152 boreholes with a depth from 70 to 90 m were drilled for the installation of plate groundings).

The State Commission accepted the installations with the evaluation "excellent." Checking on the quality of the work was carried out routinely by a specialized service of the customer.

However, the construction of the watch settlement and the construction of bases for operating workers at Karazhanbas is still proceeding unsatisfactorily.

The Main Administration of Construction in the Petroleum and Gas Industry and the Turkmenneftegazstroy must take measures for a marked intensification of work, bearing in mind the objective that already in the first half-year not less than four sections of living quarters will be put into use and the most pressing goals must be achieved in construction of the bases. It is necessary to increase the personal responsibility of workers. There is a need for the further strengthening of discipline at all levels, in all work sectors, and an intensification of checking on the decisions made.

What conclusions can be drawn from the experience gained in exploitation of the new petroleum region in Kazakhstan?

1. In the branch there is a great reserve for increasing the efficiency of work. The "Orggazstroy" Trust and institutes must make a more detailed generalization of the experience in carrying out construction work on the Buzachi Peninsula.

2. The implementation of the formulated objectives was made possible by the so-called complex approach, taking into account the organic unity of technical, economic, organizational, social and ecological aspects in the search for an effective solution of any problem, as reflected in documents of the Collegium of the Ministry of Construction in the Petroleum and Gas Industry.

3. Success has been facilitated by the programmed approach in which allowance is made for interbranch problems, combined with the system for branch and territorial planning which has justified itself in practice.

4. The concentration of production is necessary in order to meet specific goals. Its possibilities are especially great in the complex conduct of work. A knowledge of the technology of the created industrial complex is necessary. A major effect is attained by the introduction of the latest advances in scientific and technical progress and in improvement in control.

5. Positive results are ensured by a well-developed interaction with operating personnel, coordination of the operations of all organizations engaged in work on the facilities to be constructed.

6. The creation of the necessary conditions for work and life for the workers is of great importance for successful construction, especially in difficult climatic zones.

7. A reduction in the time required for bringing in a new petroleum region was facilitated by the personal and group responsibility in the adoption of decisions and implementing them and also well-coordinated work with local Party and soviet organizations.

At the present time the objectives of the subdivisions responsible for further work on the petroleum deposits on the Buzachi Peninsula are a rapid increase in petroleum production capabilities, connecting up of group measuring apparatus, construction of means for maintaining stratum pressure, putting the Karazhanbas field into operation, accelerated construction of industrial bases and cultural-public facilities, further development of socialist competition in order to greet the 110th anniversary of the birth of V. I. Lenin with distinction, and successful implementation of the goals for the final year of the five-year plan.

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UNPOSTPONABLE TASKS IN DEVELOPMENT OF DRILLING WORK

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 7, Jul 80 pp 3-7

[Article by N. A. Mal'tsev, minister of the Petroleum Industry]

[Text] In the development of the productive forces of socialist society petroleum has always played and in the future will play an exceptionally important role. Suffice it to mention that during the last 15 years the production of petroleum with gas condensate, satisfying the constantly increasing needs of the national economy, has increased in our country by a factor of 2.4 and in the current year will surpass 600 million tons.

Such a considerable growth has been attained due to the intensive creative work of Soviet geologists and petroleum workers. A role of more than a little importance has been played by drilling workers, who have ensured an increase in its volumes in accordance with the stipulated rates of increase in production. In case of necessity they have routinely redistributed the volumes of drilling work by regions. And they have restructured drilling technology applicable to the changing conditions for the drilling of boreholes. For example, at the present time more than half the drilling work is concentrated in Western Siberia with its severe natural-climatic conditions, requiring new solutions in the organization and technology of drilling of deposits. Specifically here complex conditions have made necessary the widespread use of the cluster method for the drilling of slanting boreholes, gradually adopted in other regions as well. During 10 years there has been an increase in the volumes of operational drilling under such severe natural-climatic conditions as in the Komi ASSR by a factor of 5 and in Permskaya Oblast by almost a factor of 2.

Already in the Tenth Five-Year Plan the volumes of operational drilling in the branch have increased from 8.6 to 17 million meters, and for the Glavtyumenneftegaz -- from 2.7 to 9 million meters. The principal increase has come about in the last three years.

In the immediate future drilling work will have a decisive role in developing the production of petroleum in the country.

As is well known, there are two fundamentally different ways to increase the volume of drilling. The first, which has been most important in the past, involves an increase in the number of drilling crews and accordingly, an increase in the number of operating drilling rigs. The second is an overall increase in work productivity on the basis of the most effective use of existing equipment, work methods and work organization and on the basis of accelerated technical progress in the entire cycle of borehole construction.

It goes without saying that both approaches will occupy an appropriate place in the coming broadening of the volume of drilling, but without question preference must be given to the second approach. In a summary report to the Central Committee CPSU at the 25th Party Congress, L. I. Brezhnev clearly emphasized: "In order to find a successful solution for the great number of economic and social problems facing the country there is no alternative but a rapid increase in work productivity, a marked increase in the effectiveness of all social production." This highly important requirement was again emphasized by the November (1979) and June (1980) plenary sessions of the Central Committee CPSU.

An increase in the volume of drilling by means of the reserves available in an increase in the efficiency of production and the quality of work by drilling enterprises is an entirely realistic objective, as is confirmed by the experience of drillers. It is well known that a decree adopted in 1971 by the Central Committee CPSU and entitled "Widespread Dissemination of the Work Experience of Progressive Brigades in the Petroleum Industry and Geological Prospecting Organizations" was directed precisely to an increase in the effectiveness of drilling work. In implementing this decree and creatively developing the socialist competition of drilling and rig construction crews, drilling workers were able to achieve substantially important results. One of these was a successful solution of the problem formulated by the 25th Congress CPSU on reduction of the time required for the drilling of boreholes by 25-30%. In the course of the competition of drilling crews there was found to be indisputable advantages of a reasonable, carefully thought-out use of all the best which can come from standard-produced equipment, developing technology and the experience in organizing work. As is well known, progressive drilling crews on this basis are achieving considerable results. Leading specialists in production and at scientific research institutes are giving them great assistance along these lines.

In the course of socialist competition of drilling crews they have exhibited new and valuable work initiatives which have received recognition and support at many combines. In particular, we should mention the work of the drilling crew of master D. M. Nurutdinov, who vigorously developed the movement under the motto "Oil Wells — in Production!" For the first time developing in Tatana, this initiative spread rapidly through the enterprises of the branch and was a major contribution to shortening the time required for the drilling of wells. Significant results are coming from the broad spreading of the movement under the motto "No One Lagging Behind!," developed on the initiative of the drilling crew of the Kuybyshev master Hero of Socialist Labor I. G. Feklov.

At the Grozneft' Combine the drilling crew of master A. G. Shulikin was the initiator of a competition for the drilling of 5,000 m a year or more per brigade and called for accelerating the pace for ending superdeep holes.

The initiative of the Groznyy workers should find broad response at the Azneft', Ukrneft' and Nizhnevolzhskneft' Combines and in other regions where superdeep holes are being drilled.

Experience shows that by no means everywhere is there a correct attitude concerning progressive drilling experience. For example, the movement under the motto "Oil Wells -- in Production!" has not been adopted extensively at the Turkmenneft', Orenburgneft', Permneft' and Uzbekneft' Combines. At these combines, as a result of serious shortcomings in the organization and technology of drilling work related to its implementation in areas which are not built up, there are great nonproductive expenditures in the drilling of boreholes. Therefore, the restructuring of the entire organization of work on the basis of the experience of progressive enterprises and drilling crews would enable combines to bring about more rapidly the elimination of the excessively great idle time of holes which are completely finished while awaiting final touches and entry into production and also the elimination of other shortcomings and omissions which hold down the rates of drilling work. For the most part due to shortcomings in the organization of drilling in general, for the branch as a whole during the first half of the year the plan for 238 drilling crews (of a total of 1,288) was not met.

Other facts indicate that there are unexploited drilling reserves. For example, it is noteworthy that in each region there is a great gap between the mean indices for drilling per one brigade and the indices for progressive brigades. This can be seen from the results of drilling in such a key region as Western Siberia. There the drilling per brigade in 1979 was distributed as follows (see tabulation).

Drilling per brigade, 1000's m/year	Up to 20	20-30	30-40	40-50	50-60	60-70	Over 70
Number of brigades Glavtyumenneftegaz	10	14	25	29	19	4	9
Number of "watch"-expeditionary brigades	9	15	10	9	3	-	-

The cited data show that the drilling indices per one brigade for the Glavtyumenneftegaz differ by more than a factor of 3.5, although the holes here are approximately identical with respect to complexity and equipment.

Accordingly, the reason for the success of progressive brigades is the bold and capable leadership of experienced masters ensuring an excellent organization of labor, well-integrated interaction within the brigade, strong technological and work discipline. A similar situation is also characteristic for other petroleum regions.

Thus, the creation of conditions for the highly productive work of all drilling crews should become the principal direction in the activity of the directors of drilling work administrations and combines. The record and high achievements of innovators are not an end in themselves, but a very important means for the mobilization of workers. There is need for directing efforts for achieving high technical and economic indices and attaining the maximum amount of drilling annually by all drilling crews and entire drilling enterprises.

First of all it is necessary to ensure effective work by each service, by each production team. Directors and engineering-technical workers must concentrate their efforts primarily on an increase in work productivity, in attaining the best final results. Such an objective is set forth in a decree of the Central Committee CPSU and the USSR Council of Ministers entitled "On Improving Planning and Strengthening the Economic Mechanism for Increasing the Effectiveness of Production and the Quality of Work."

Along these lines as well the principal direction is a universal development of socialist competition, directed to the maximum use of the reserves of technological processes and equipment. The success of the work in the last analysis is governed by people. Therefore, the enthusiasm of the people and the work efforts of personnel must be directed to the performance of a specific task and ways to follow through in its solution must be formulated. In practical work there are more than a few examples when highly effective work is realized through the organization of the technological process in accordance with a unified complex order. For example, in construction the Zlobin method is widely known; in machine building there is wide knowledge of the experience of such production combines as the Kaluga Turbine Plant and Uralmash, where the brigade form provides for inclusion in a unified team for the production of an article not only the main team, but also associated teams with stimulation of all for a final result.

Under the conditions of the petroleum industry the organization of work on the basis of complex arrangements, taking into account the activity not only of drilling brigades, but also road builders, tower construction crews, geophysicists, brigades for the outfitting and finishing-up of wells, electricians, workers with control and measuring instruments and automatic equipment, workers in technical and control administrations and sections and in other subdivisions, would speed up the putting into operation of the basic production units, wells, and would thereby facilitate an increase in petroleum production.

In this connection, in order to bring the implementation of this entire complex of drilling work into good order the time has come to introduce so-called network schedules everywhere. These make possible a clearly defined tie-in of work in the entire cycle of construction of wells to the specific functions of the material-technical supply and production servicing subdivisions. The network planning without question raises the organization of drilling work to a higher level. The work of the VNIIOENG [All-Union Scientific Research Institute of Organization, Management, and Economics Economics of the Oil and Gas Industry] should be directed to solution of this problem together with the combines.

During recent years the scientific research and design organizations and enterprises and organizations of related branches have created new equipment, pipes, tools and chemical reagents for drilling. For example, the Uralmashzavod has begun to produce new drill rigs, in particular, for cluster drilling. Bit factories have mastered the production of bits of a new design for low- and high-speed drilling. Screw-type hydraulic face motors have been mastered by production plants and are in successful use. New designs of turbodrills are being introduced simultaneously. The production, although in an inadequate quantity, of more durable casing and drill pipes of an improved design, has been initiated.

Progress has also been achieved in another important field: in the composition and processing of drilling and plugging muds. Enterprises have changed over to drilling muds of bentonite with weighting by a baryte concentrate. Due to the mechanization of the processes of transport and storage of materials and the preparation of drilling muds the time input in this work has been reduced by a factor of 7.

Measures for improving drilling methods and equipment have somewhat improved the technical and economic indices for drilling work. For example, from 1970 through 1979 the drilling per bit has increased from 27 to 67 m; the industrial rate has increased from 1,250 to 1,677 m/month; drilling per crew per year has increased from 7,545 to 12,291 m. The occurrence of accidents has been reduced; the time required for the elimination of damage per 1,000 m of drilling has been reduced from 96.3 to 38.9 hours.

The time required for the construction of wells in 1979 in comparison with 1975 in operational drilling was reduced by 25.8%. This was facilitated by the organization of continuous drilling work, testing (acceptance) of wells, as well as the introduction of new conditions for the material stimulation of crews for completing the construction of wells.

However, the reduction in the average time required for the construction of oil wells has been achieved for the most part by a decrease in the time required for rig construction and the testing of holes by 22.8 and 53.5% respectively in comparison with 1975, whereas the time required for drilling is decreasing extremely slowly. Thus, combines as the first order of business must insistently seek and most completely exploit work productivity reserves in this stage in the construction of wells. Efforts must be directed to this by scientific research organizations which are developing measures for improving drilling work.

The development of drilling work to a considerable degree will be determined by the rates of technical progress. That which has been done in this field during the last decade gave definite results. However, petroleum workers are not satisfied merely with the volumes of production of equipment, pipes, materials and chemical reagents, but also their technical level and quality.

Petroleum workers regard it as their duty to formulate clearly the goals of technical development in the field of drilling, which must be solved with the assistance of related branches.

In petroleum machine building in a short time it is necessary to master the standard production of a variety of very effective rolling cutter bits, especially for low-speed drilling regimes. Numerous experimental studies made at drilling enterprises indicated that low-speed regimes for the destruction of rocks ensure a multiple increase in drilling per bit — an index directly determining drilling rates. For example, the Kuybyshev Combine has attained an increase in drilling per bit by a factor of 3-4. Reference is not to individual experiments, but to stable indices obtained with the mass use of the rotary drilling method. However, recently the quality of rolling cutter bits produced by the factories of the Ministry of Chemical Machines has deteriorated, especially with respect to new designs for low-speed drilling. There have been cases of the delivery of bits with unfilled systems for the lubrication of cutter mountings, low-quality welding of lugs, great deviations in diameter.

It is very important to increase the quality of fabrication of face motors, the volume of drilling with which is more than 70-75%, and in regions of Western Siberia -- a full 100%. There are more than a few cases when the turbodrills and screw-type face motors supplied by the "Turbobur" production combine even prior to use require serious repair, even including the recutting of screw connections. The quality of fabrication of screw-type face motors is especially unsatisfactory, as a result of which the average time between repairs in their use does not exceed 30-35 hours, whereas when they are fabricated in full accordance with technical specifications this period is more than 70 hours and for the experimental models produced by the All-Union Scientific Research Institute of Drilling Technology it exceeds 100-120 hours. Machine builders are extremely slowly organizing the large-scale production of circulation systems, on which are dependent both the operating indices for the bits and the interrepair period for the face motors and the quality of drilling of holes. It can be said without exaggeration that the bit, the face motor and circulation systems are the three principal problems which petroleum machine builders must solve first and foremost.

A highly important problem which the workers in the heavy machine building industry must solve for petroleum workers is an acceleration of the mass production of new drill rigs. The time has come to supply drill rigs with the bases, towers and associated structures, etc. all together. The incomplete delivery forces drilling organizations to fabricate, under field conditions, 150-200 tons of metal construction components for each drill rig, this resulting in a reduction in the quality and reliability of the components, an increase in the expenditures of metal and time on assembly work.

Petroleum workers are particularly concerned with the status of production of casing, drilling and pump-compressor pipes, the need for which is increasing proportionally to the increase in the volume of drilling. However, in the solution of this problem there are major questions which are closely related to one another.

First, the volumes of production of pipes, the increase in which involves great capital investments. However, it is impossible to get by without this, since in the future the drilling of holes must increase by a multiple number of times.

Second, the quality of the pipes. Each year drillers, in checking pipes in the field, reject 4-6% of the casing pipes. This is equivalent to the nonreceipt of 40,000-60,000 tons of pipes and corresponds to a loss of 400-600 boreholes.

Third, mastery of the mass production of pipes of modern designs which are more durable. As a result of this alone, taking into account the needs for the future, petroleum workers will be able to save about 400,000-500,000 tons of pipes per year, which is equivalent to the annual production of a large pipe-rolling plant.

Thus, this is not only a problem in the development of the petroleum industry, but also a major national economic problem.

In the chemical industry there is a need for solving all the problems involved in supplying drillers with high-quality reagents for the processing of drilling muds. During recent years there have been virtually no positive changes in this field. With an increase in the volumes of drilling the supply of drilling organizations with chemical reagents is constantly decreasing and at the present time is 40-60%, and some highly effective reagents (metas, M-14, OETs, and others) are not produced at all.

The Party and the government are constantly devoting great attention to the problems involved in the technical reoutfitting of drilling work, as a result of which the necessary prerequisites have been created for a marked improvement of the situation in this field. At the same time it is very important that the equipment going to outfit drilling organizations be operated rationally, with the maximum use of all its potentialities.

The petroleum industry has a great army of engineers and technologists in production work and scientific workers. Precisely they must solve the problems involved in the effective use of technical facilities. First of all, there is need for a marked improvement in the quality of development of projects for the construction of boreholes, an increase in their reliability and through them an intensified introduction of the attainments in science and technology. This is all the more important in that in the next two or three years plans call for the shifting of drilling to planning, material-technical support and financing in accordance with the specific projects for the construction of wells without scaling to the actual geological-technical conditions.

The attitude toward the technological regulations for the construction of boreholes should become completely different. In many regions they have been widely disseminated, but have not yet become a guide for action. But it is precisely the proposals and technical regulations for the construction of holes which will ensure a high quality of their construction and the complete use of the potential resources of technical facilities.

The technological services of drilling organizations should give particular attention to the rational use of different drilling methods in order to draw from them the maximum advantage in the attainment of high drilling indices. The solution of this problem is not being approached with proper understanding and responsibility in all regions.

Now we will return to the work experience of the Kuybyshevneft' Combine, where rotary drilling is used extensively. There they have attained a multiple increase in drilling per bit (from 22.1 to 42.3 m). However, with a constant mean depth of operational holes the industrial rate of drilling -- an index characterizing the rates of construction of wells and the level of work organization -- during the last four years has increased only from 842 to 922 m/month. Here, evidently, there are serious miscalculations in the organization of technological processes. Despite a marked increase in the time of presence of the bit at the face, the percentage of work on drilling in the time balance virtually did not change and even decreased somewhat. Accordingly, the engineering-technological services with the introduction of the rotary drilling method solved the problem unilaterally, without a multisided approach to the effective use of the possibilities of this method. This example is evidence that only the multisided solution of all the problems involved in the construction of boreholes, from the introduction of new technical facilities and productive technological processes to the organization of production, can ensure a high effect.

The "watch"-expeditionary method for the exploitation of new regions requires further improvement. It has demonstrated its viability, although in the initial period of introduction, and even now there are unsolved problems requiring serious attention. The most important of these is the setting of clear interrelationships between local organizations and customers, the creation of production bases for timely material-technical servicing and corresponding cultural-living conditions for the highly productive work of the arriving drilling personnel. Some problems have already been solved, but with the planned expansion of drilling work much remains to be done in this direction.

However, with the adoption by the Central Committee CPSU and the government of additional measures for the intensification of construction in regions of Western Siberia, the Glavtyumenneftegaz, local combines, drilling work administrations and tower erection administrations must develop a long-range program for the strengthening and development of their own production personnel. In the future the main increase in the volumes of work must be foreseen for these particular groups.

Among the most important conditions for the successful development of drilling work we must include the timely and most complete preparation of areas for the development of drilling work in them, including the creation of productive drilling bases. In the prior construction of roads, power supply facilities, water lines, engineering structures, residential quarters and social-cultural facilities in the new deposits it is necessary to take into account the needs of drilling, bearing in mind that the beginning of industrial exploitation of a deposit is preceded by an extremely important period of its exploratory drilling. This applies to many petroleum regions, especially in Western Siberia.

Continuing the Leninist Work Watch, progressive groups in the branch, in response to a resolution of the June (1980) Plenary Session of the Communist Party CPSU on the holding of the 26th Congress of the CPSU on 23 February 1981, proceeded with initiative in the broadening of socialist competition for a worthy meeting of the 26th Congress of the CPSU and adopted increased socialist obligations for 1980 and by the day of opening of the congress. Among these groups are those of the Bashneft', Yuganskneftegaz and Grozneft' combines, Aznakayevskoye Administration of Drilling Work, Nizhnevartovskoye Administration of Drilling Work No 1, the drilling brigade of Master Hero of Socialist Labor A. D. Shakshin of Nizhnevartovskoye Administration of Drilling Work No 2 and others.

The personnel of the Ministry of the Petroleum Industry and the Presidium of the Central Committee of the Trade Union of Workers in the Petroleum and Gas Industry on 3 July 1980 approved this patriotic initiative of progressive groups. The task of all directors, Party, trade union and Komsomol committees is the universal support of work endeavors and creation of all conditions for highly effective work in attaining the best results in the final year of the Tenth Five-Year Plan.

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BELKOVSKAYA PLANT TO PRODUCE SYNTHETIC OIL FROM COAL

Karachi BUSINESS RECORDER in English 18 Oct 80 p 2

[Text] Moscow: The Soviet Union has broken ground for its first oil-from-coal plant, a pilot facility designed to turn 10 tonnes of solid fuel into a quarter of that amount of oil daily.

The plant, which is being built at the Belkovskaya mine in the Moscow coal basin, will be the forerunner of other, larger ones situated in the Kansk-Achinsk lignite fields in central Siberia. If successful, they could help the Soviet Union use the huge deposits there--estimated at up to 600bn tonnes--to offset their looming oil shortage.

The pilot plant is based on a process developed at the Moscow Institute of Combustible Minerals, which the Russians claim is better than those in use elsewhere.

The coal is crushed to a fine dust, dried in a heated vacuum and mixed with heavy oil and a catalyst derived from oil according to Soviet officials. After mixing with hydrogen, it is pumped into a heated, pressurized tank where it turns into oil that can be separated into petrol and heavier fractions by boiling.

The Russians say they have found a catalyst that enables them to use lower heat and pressure than other processes. The Moscow Institute which has been experimenting since 1968, is currently turning out three litres a day by this process. It takes four kilos of coal to produce one kilo of oil.

Plans are now being drawn up for a coal-to-oil plant to produce 70 tonnes a day at the Bekovskaya open pit in Kansk-Achinsk.--BR-FT Service

CSO: 1812

OBITUARY OF NIKOLAY PETROVICH DUNAYEV

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 7, Jul 80 p 78

[Article signed by a group of comrades]

[Text] Nikolay Petrovich Dunayev, chief engineer, first deputy chief of the Main Tyumen' Production Administration for the Petroleum and Gas Industry, died prematurely on 5 June 1980.

N. P. Dunayev was born on 18 January 1939 in a family of workers in Kuzovatovo village in Ul'yanovskaya Oblast. He began his work activity in 1958 after graduating from the Syzran Petroleum Technical School. He worked as an operator in gas production at the Saushinskiy gas field of the Nizhnevolzhskneft' Combine. After 1961 he successively occupied the posts of operator, master and section chief in petroleum production at the Dmitriyevskiy petroleum field of the Kuybyshevneft' Combine. From that time to the last days of his life he associated himself with the petroleum industry, giving it his energies and knowledge.

Beginning in 1966 N. P. Dunayev was transferred to work in the petroleum industry of Western Siberia, being assigned to the post of senior engineer in a petroleum field and then as chief engineer - deputy chief of the Yuganskneft' Scientific-Production Administration. Later he worked as chief engineer - deputy chief of the Nizhnevartovskneft' Petroleum and Gas Production Administration and as chief of the Megionneft' Petroleum and Gas Production Administration.

A young, but already experienced specialist and organizer of production, N. P. Dunayev rapidly acquired authority among the body of Tyumen' petroleum workers and won deep respect from his work comrades.

During the time of his work at the Glavtyumenneftegaz he took a direct part in the exploitation of deposits, brought about their operation ahead of time, and directed the introduction of equipment and apparatus for the mechanization and automation of production.

Combining a great deal of productive work with study, in 1974 N. P. Dunayev graduated from the Tyumen' Industrial Institute. A talented engineer, a work-loving and modest worker, gifted with great erudition, N. P. Dunayev in 1977 advanced to the responsible post of chief engineer - first deputy chief of Glavtyumenneftegaz. In this post he continued the glorious traditions of Tyumen' petroleum production specialists, always and insistently achieving a high technical culture of production, a bold search for new technical solutions. N. P. Dunayev headed and boldly directed major work for a further increase in the technical level and effectiveness of production under the complex conditions of Western Siberia, extensively involving in this work specialists and innovators of production, workers of scientific research and design organizations.

In 1969 N. P. Dunayev entered the ranks of the CPSU. He was always characterized by a constant and active participation in public and Party life, was a deputy in the okrug soviet, carried out responsible assignments, headed the organization of the Scientific and Technical Society of the Petroleum and Gas Industry of the Main Administration, and was an active lecturer at the "Znaniye" Society.

The productive and self-sacrificing work of N. P. Dunayev has been recognized by government awards -- the Order of the Red Banner of Labor and two medals.

The glorious memory of Nikolay Petrovich Dunayev will forever remain in the hearts of all who knew him and worked with him.

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